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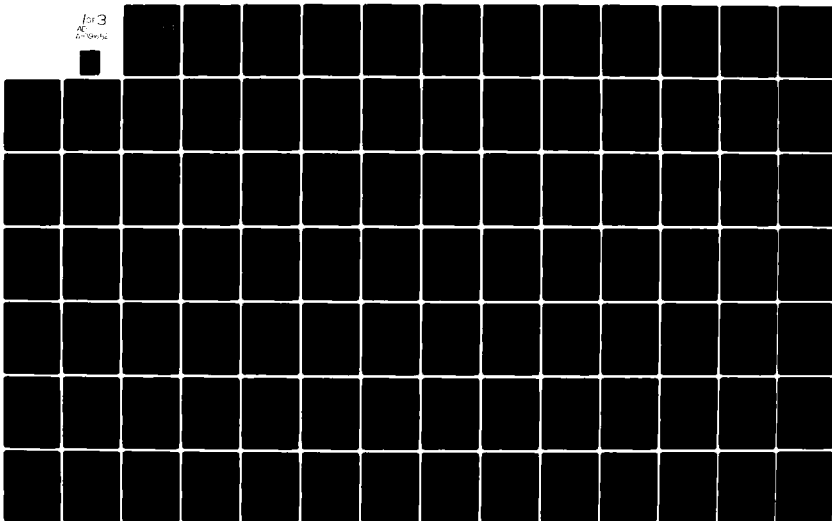
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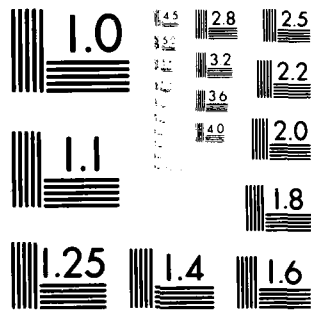
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This study examines and analyzes possible soviet views on the strategic significance and utility of civil defense for deterrence, war-fighting and crisis management. Specifically, it describes and assesses soviet views on the need and requirements for and the role of civil defense in the soviet defense posture, policies and strategy and on its contribution to war fighting, war outcome and recovery. It analyzes the soviet targeting doctrine and its relationship to civil defense priorities, measures for assuring system, national		

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and economic survival and essential support for the armed forces. The study also examines possible methods for soviet exploitation of its civil defense capabilities for crisis management.



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EXECUTIVE SUMMARY

THE STRATEGIC DIMENSIONS OF SOVIET CIVIL DEFENSE

1. The Soviets recognize that modern strategic systems can not only rapidly achieve decisive strategic results, but also threaten the destruction of the vital functions of the homeland. Such destruction could have a decisive influence on a country's ability to wage war and on its outcome, and could nullify the significance of successful military actions. At the same time, the Soviets view a balance of "mutual vulnerability" or "mutual assured destruction" as depriving their military power of its political and military utility, and as being inherently unstable. Given the assumed irreconcilability of the fundamental objectives and interests of the two opposing systems, they see their relations as fraught with great uncertainties. Consequently, the Soviets do not exclude the possibility of an all-out nuclear war between the systems.

2. The Soviets have sought a solution to this nuclear dilemma which would enhance their deterrence and war-fighting capabilities and facilitate the pursuit of their foreign policy objectives. They believe that the key objective of their military posture and strategy, whether for credible deterrence or rational war fighting and war aims, must be the assured survival, or better yet, unilaterally assured survival, of the Soviet Union.

3. The Soviet war survival strategy is considered to be based on a combination of a "preemptive" first counterforce strike, large-scale active defense and a comprehensive civil defense program. The latter is seen as an "objective necessity," because the active military means cannot assure that a portion of enemy strategic weapons would not survive and reach their targets, and because of the possibility of an enemy surprise attack. Consequently, civil defense is an "integral" part of the Soviet Union's strategic posture, planning and capabilities. It is said to be a "factor of strategic significance" and potentially a "decisive strategic factor in wartime." It bears directly on the "correlation of forces" between the opposing systems, as well as on the attainment of superiority in the course of a war and at its outcome. Therefore, it appears neither detente nor SALT have diminished Soviet interest in their civil defense program. On the contrary, SALT I was followed by a significant upgrading of the status of USSR Civil Defense in the Ministry of Defense, and by increased efforts and investments to further improve its capabilities and state of readiness.

4. The objectives and mission of Soviet Civil Defense are to assure: (a) system survival, i.e., political, governmental, economic C³, which is a primary Soviet aim and requirement; (b) the survival of essential elements of the population and economy to assure effective support of the war effort and for post attack recovery; and (c) capabilities for large-scale post-strike damage-limiting, repair and restoration efforts. The Soviets hope that this would help them attain superiority in the course of military operations. It would also contribute to the emergence of the Soviet Union from the war with superior national-military power to control its adversaries and potential challengers and to establish its global preeminence. By the same token, the Soviet war-survival capability would deny to the U.S. the ability to threaten the Soviet Union with "assured destruction," while lending greater credibility to Soviet deterrence.

5. The Soviets recognize the critical importance of surprise for a successful counterforce strike. At the same time, they note that modern means of reconnaissance, surveillance and early warning make surprise difficult to achieve. In their view, successful surprise requires concealment, deception and effective countermeasures against enemy surveillance and early warning systems. One problem in this regard is the time consuming and highly visible implementation of certain civil defense measures, such as the pre-attack evacuation of the urban population. Of particular interest and possible significance, therefore, is the post-1972 emphasis in the Soviet Civil Defense program on the development of capabilities for sheltering in-place the "entire population" of primary target cities and at important installations.

6. The Soviets believe that civil defense measures can significantly contribute to the preservation and continuity of political, governmental and economic C³, assure the mobilization of the Soviet armed forces and logistic support for the conduct of military operations from stockpiles and new defense production, limit human losses and preserve popular morale and will to fight, and facilitate a more rapid post-attack recovery.

CRITICAL ELEMENTS OF THE SOVIET CIVIL DEFENSE PROGRAM

7. Soviet Civil Defense priorities and requirements are essentially in accord with the Soviet strategic targeting doctrine. This doctrine reflects what the Soviets believe to be primary war aims, namely the destruction of the opponent's political system and of his "sources of military power," including his "military-economic potential." Priority, therefore, is given to the destruction of those targets "which have the greatest influence on the course and outcome of the armed struggle." These targets include: the enemy's strategic forces, his military C³I, military bases and

large troop units, political-governmental C³, defense industries, transportation, communications, energy systems and other essential economic capabilities, including stockpiles capable of preserving and reconstituting the enemy's ability to wage war. The population is not targeted per se, but will be at risk if it remains collocated with priority targets.

8. The Soviets appear to expect that in the event of a war the U.S. would likely adopt the Soviet strategic targeting doctrine, because it is seen as best suited for war fighting purposes. To the extent that the U.S. would not do so, the Soviets appear to believe that U.S. strikes would not achieve optimal effectiveness and may constitute a misuse, if not a waste, of American strategic assets. The Soviets, therefore, assign differentiated priorities and degrees of protection to individuals, organizations, installations and entire cities. This differentiation is established in terms of their importance to system and national survival, their potential contribution to the war effort, and the probability of their being targeted by the enemy.

9. Highest priority is given to the protection of political, governmental and economic C³ at all levels, from the national to city districts and managers of installations and enterprises, especially those required to remain in operation in wartime. This leadership element is provided with blast shelters at places of work, often at residences, and also at out-of-city dispersed and concealed command posts. The importance attributed to the preservation of the leadership element is not so much because of fear of potential political unrest, but because it is essential for system survival in general and for effective control, coordination and implementation of the war effort. The Soviets appear to believe that under nuclear war conditions the dependence of the population on the authorities will increase. They also may not be overly concerned by the possibility of what they would view as a temporary loss of control over some elements of the ethnic minorities on the periphery of the Soviet Union if this does not significantly affect the Soviet war effort.

10. A particular feature of C³ in a nuclear war will be the increased physical concentration of leadership elements. At the national level, authority will be vested in a Defense Council or State Defense Committee, presumably located in a single command complex. Below that level the key political and administrative officials will be located together with their appropriate civil defense staffs in hardened command posts. Although this concentration of key leadership personnel may constitute a potential vulnerability, the Soviets expect that the number, dispersal, concealment and hardiness of these command posts will be effective in preventing their widespread destruction. Furthermore, the Soviet

nomenklatura system (i.e., ready lists of approved potential candidates for significant posts) facilitates the rapid replacement of leadership personnel. Alternate C³ organizations at critical points in the chain of command also appear to exist, and, if necessary, military control and communications may be temporarily substituted for destroyed C³ links.

11. Detailed crisis relocation plans exist for all elements of the urban population and workers at important installations, and are tested in small-scale exercises. The implementation of crisis relocation will be coordinated with, and if necessary, assisted by the armed forces, which may also help build expedient fallout shelters. The crisis relocation will be conducted in a highly organized and controlled manner, to pre-assigned destinations and by dedicated transport, or in organized groups on foot. The Soviet crisis relocation system makes it possible for the authorities to quickly find and use evacuated individuals and organizations, when so required. Significant portions of the urban population, including the most valuable ones, could probably be evacuated and dispersed in 48 to 72 hours.

12. Protection in blast shelters is provided in order of priority to "elite" elements and essential workers, school children, students and medical personnel and the general population in accordance with the probability that a given locality, installation or enterprise would be targeted by the enemy. Special priority is given to residents of cities which are likely targets for multiple enemy strikes because of the number of priority targets located in or near them, and to wartime workshifts of enterprises and installations which will continue operating in wartime. Shelters are provided first of all at places of work and are supplemented to varying degrees by shelters in residences and dual-purpose shelters such as subways, underground garages, tunnels, mines, etc. Some important cities, therefore, have sufficient shelters to accommodate a high percentage of their residents. Others provide shelters primarily for their leadership and elite elements and essential workers, but to a lesser extent for their general population. In a crisis, however, the shelter inventory could be rapidly expanded by the construction of expedient blast shelters.

13. There may be some grounds to suspect that overall the Soviets give greater priority to the protection of populations in the Soviet "white" heartland, notably in the RSFSR and Ukraine. If this were to be confirmed, it may be so because of the special importance of these territories for system and national survival, their critical role in the Soviet war effort, and the likelihood that they will be the primary focus of enemy strikes. By implication, it is possible that large losses among non-Russian ethnic minorities may not be viewed by the Soviet leadership as being "unacceptable" or

as dangerously weakening the Soviet Union's war-fighting capabilities. It is also possible that the Soviets do not expect the U.S. to "waste" weapons for the purpose of destroying such population elements.

14. Soviet shelter hardnesses vary in accordance with the importance of their occupants and their proximity to likely enemy aim points. They also vary in their capacities, filter-ventilation equipment, whether they are permanent or built in an emergency, and whether they are in basements or separate standing. The Soviets have established at least five categories of shelter hardnesses (mainly in the range of 40 to in excess of 150 psi). It appears likely that these shelters will be effective against air bursts of relatively low yield nuclear warheads targeted against military and industrial installations. The main deficiency of Soviet public shelters is that they are not usually pre-stocked with food. This, however, could be done if the Soviets have sufficient early warning.

15. The Soviets generally anticipate a requirement for relatively short shelter occupancy--a matter of a few days. They appear to believe that U.S. countervalue strikes will be conducted largely with relatively low yield weapons detonated in an air burst mode and generating little fallout. Such a view is also reflected in the Soviet belief that the evacuated and rural populations will require only simple fallout shelters for short-term occupancy. It is also indicated by Soviet plans to initiate massive rescue, damage-limiting and repair operations in the zones of destruction by large civil defense and military forces immediately following nuclear strikes.

16. The Soviets attach great significance to the preservation of the viability of the economy in wartime. They believe that the "correlation of economic forces" and especially relative economic advantages can have a significant, and in the event of a protracted war, decisive influence on the course and outcome of a war and postwar recovery. In viewing the essential elements of their economy and their vulnerabilities, the primary importance attaches to those elements which are believed to be most critical for sustaining a Soviet war effort. In the Soviet view, the most critical elements include: economic C³, energy systems, transportation, defense, oil, chemical, electronic, precision, medium machine building and instruments industries, and reserves and stockpiles. The Soviets anticipate the possibility of temporary isolation of economic regions as a result of the disruption of transportation and the destruction of important enterprises and of "entire economic regions." They seek, therefore, to develop plans and capabilities for making each economic region or large complex more self-reliant in an

emergency, and capable of functioning for some time without normal supplies of fuel, raw materials, parts, etc.

17. The Soviets rely on a complex of measures for the protection of their economy. These include: secrecy, concealment, selective full or partial hardening, dispersal and duplication, selective relocation of enterprises to prepared hardened and/or dispersed sites, measures for hasty hardening of critical machinery and equipment and for reducing vulnerabilities to secondary damage, readiness for rapid shut-down of machinery and equipment, preparation of emergency stand-by equipment, water and fuel supplies, maintenance of large, protected and/or dispersed stockpiles of food, fuel, raw materials, machinery, spare parts, etc. Also included are capabilities for rapid post-strike damage-limiting and repair operations at damaged facilities and enterprises. The full extent of the implementation of all of these measures is not known, although there are known instances of all of these measures having been put into effect.

18. Soviet military spokesmen have been urging the hardening of critical enterprises for a long time. In addition to key defense enterprises, the Soviets mention as possible candidates for selective hardening: electric power stations, substations and transformer stations, chemical plants, precision, instrumentation, electronics, medium-machine building and ball-bearing plants, and storage facilities. Hardening of large metallurgical and heavy machine building plants as well as oil refineries apparently is not deemed to be practical. However, such enterprises are not believed to be necessarily critical for the war effort, especially in a relatively short war. The full scope of Soviet plans and preparations for emergency relocation of selected enterprises is also not known. It is possible, however, that the number of protected enterprises in these two categories is sufficiently large to constitute a factor of strategic significance.

19. Industrial dispersal consists primarily in the progressive construction of new enterprises in localities with little or no industries, and the geographic construction and dispersal of satellite plants of large, older enterprises. Another form of dispersal is represented by the Soviet war mobilization plans of the economy, which would result in a significant dispersal and duplication of additional defense production. However, while considerable efforts have been made to build new significant enterprises in new localities, especially in Siberia, the modernization and upgrading of old plants in major cities has resulted in increasing their density.

20. Of special significance for Soviet war-fighting and war-survival capabilities are reserves and stockpiles. Soviet spokesmen indicate that these will be of critical importance, especially during the most intense phase of an all-out nuclear war, to assure

logistic support for the armed forces and to sustain the population. These stockpiles are also believed to be essential for maintaining critical industrial production and for repairing damaged enterprises, energy and transportation systems, as well as for speeding post-attack recovery.

21. A number of other Soviet Civil Defense measures to protect the economy are noteworthy. For transportation, they include the dispersal of rolling stock and vehicles, the building of rail and highway by-passes around major cities, the duplication of important bridges and possibly the construction of footings for emergency bridges on important routes. Large civilian as well as military capabilities are maintained for rapid repair and restoration of damaged transportation routes. For energy, the Soviets appear to expect their major electric power plants to be targeted by the U.S. To reduce the vulnerability of the system, the Soviets are developing an integrated national power grid. Important plants and installations are provided power from two separate sources. Major long distance transmission lines should by-pass potential targets. Surviving essential enterprises would receive power from stand-by power stations or, if necessary, from military electric power generating equipment. It is also believed that emergency hardening measures and capabilities for rapid shut-down of equipment could materially help to limit damage at enterprises and installations.

22. The Soviets do not give any indication of the extent of losses and damage they expect the Soviet Union to suffer in various war scenarios, but believe that civil defense measures can significantly mitigate them. In the matter of post-war recovery, the Soviets appear to expect to be able to facilitate and expedite it by making use of surviving economic capacities in Eastern Europe, as well as captured or controlled economic resources in Western Europe and elsewhere in the world. The Soviet Union has had experience with the problem of recovery from heavy losses and damage in World War II (see Appendix). This recovery which was significantly facilitated and accelerated by external economic inputs, including large amounts of war booty and reparations taken from territories occupied by Soviet forces.

POTENTIAL SOVIET EXPLOITATION OF CIVIL DEFENSE FOR CRISIS MANAGEMENT

23. The Soviet Union is aware of the lack of an effective war survival capability in the U.S. and of American belief that the U.S. faces "assured destruction" in the event of an all-out nuclear war. The Soviets are also familiar with American assessments of likely U.S. losses and damage in the event of a Soviet attack. In a crisis, especially one which includes a coercive test of strength and resolve between the superpowers, the Soviets may exploit these American perceptions and the asymmetry in war survival capabilities

to weaken U.S. resolve and to gain negotiatory advantages. Because of its defensive character and flexibility, civil defense may lend itself especially well to such purposes, all the more so because it reduces the risk of provoking a rash U.S. response.

24. In order to bring pressure to bear on the U.S. and signal increasing Soviet resolve in a crisis, the Soviet Union can use a variety of escalating civil defense preparedness measures. These can range from the least threatening ones, beginning with authoritative declarations underscoring U.S. risks and the asymmetry in U.S.-Soviet war survival capabilities, to more threatening ones. The latter may include measures which increase Soviet civil defense readiness and improve its capabilities, or measures which directly improve Soviet survivability, such as full-scale urban evacuation. Various measures can be carried out in part in a covert manner in order to face the U.S. with a new level in Soviet capabilities or they can be overt and well publicized.

25. Full-scale urban evacuation of Soviet cities would be especially threatening and therefore entail possible risks of dangerous U.S. responses. It would also be costly and highly disruptive of Soviet social and economic life. The Soviets would have the option of announcing its imminent initiation or of announcing preparatory measures for it while the initiation of the evacuation would be held off for some length of time to give the U.S. an opportunity to make the concessions demanded by the Soviet Union. Soviet determination of the risks associated with the evacuation would probably depend on Moscow's perceptions of the U.S. domestic situation and the U.S. public's vulnerability to such scare tactics.

PREFACE

This draft report was prepared for the Defense Nuclear Agency under Contract Number 002-78-C-0362, as a part of an ongoing study program of strategic targeting options and vulnerabilities in support of JSTPS and OSD/NA.

The purpose of the study described in this report is to assess possible Soviet perceptions of the strategic role and utility of the Soviet civil defense program for deterrence, war-fighting and crisis management. Specifically, the study deals with possible Soviet perceptions of the strategic dimensions of civil defense, Soviet views on vulnerabilities, priorities and requirements for protection and examines possible Soviet uses of its civil defense capabilities in crisis situations to influence U.S. behavior. Included in the study are also descriptions and assessments of some Soviet war initiation and termination scenarios, and views on requirements for system and national survival and effective support of military operations, strategic targeting priorities, wartime political, governmental and economic C³, and the significance of Soviet World War II experience with damage and recovery.

The study is based primarily on Soviet open source materials. It complements and significantly expands previously published studies of Soviet civil defense conducted by the Advanced International Studies Institute, and provides new dimensions for assessments of the significance and implications of the Soviet civil defense program.

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INTRODUCTION

The contents of the Soviet Civil Defense program and assessments of its potential effectiveness, studies of what the Soviet Union is attempting to do in this area, and the indicated reasons therefore, can be highly instructive and revealing about many areas of Soviet political and strategic thinking, priorities, objectives and values.

Analyses of Soviet Civil Defense throw important light on Soviet perceptions of:

- o The nature of East-West relations and rivalry, the possibility of war between them, and the utility of military power in support of foreign policy objectives.
- o Requirements for and characteristic of credible deterrence.
- o Military doctrine and strategy.
- o Rational war aims in a nuclear conflict.
- o The character of possible wars between the two opposing systems, possible war initiation scenarios, their conduct and likely outcome.
- o Requirements for an effective defense policy and posture, conduct of war, and for a favorable war outcome.
- o Targeting doctrines, value systems, priorities and sensitivities.
- o U.S. targeting doctrine and like methods of employment of media weapons.
- o The significance and possible political-military exploitation of major asymmetries in the overall U.S.-Soviet defense postures, as well as in their strategic concepts and vulnerabilities.

Fundamental to the understanding of Soviet views on the role and utility of civil defense is the Soviet perception of the implications of the nuclear age for military power deterrence and warfare. The Soviets continuously speak of the "revolution" in military affairs brought about by the appearance of nuclear strategic offensive systems. As the Soviets see it, this "revolution" gives rise to two contradictory propositions:

1. Modern strategic offensive forces can achieve "decisive" strategic objectives independently of other forces and military operations, and can do so in a brief time span. In other words, massive nuclear strikes can achieve a quick military victory.

2. Modern strategic offensive forces threaten the viability and indeed the survival of the "rear," i.e., homeland. Enemy nuclear strikes can threaten both system and national survival as well as a country's ability to sustain and implement an effective war effort. Thus, the level of potential losses and damage may make it impossible to pursue rational war aims, negate the significance of one's own successful military operations and preclude the attainment of a politically or militarily meaningful "victory."

The Soviet Union and the United States have attempted to deal with and resolve this dilemma in fundamentally different ways. On the U.S. side, given its twin objective of strategic stability and war deterrence, the focus is on the second proposition. This has led to a tendency to see nuclear weapons as being "absolute," to a belief in the existence of "mutual vulnerability," and to the concept of "mutual assured destruction" as a desirable stabilizing factor in U.S.-Soviet relations and competition.

On the Soviet side, however, belief in the unrelenting and unavoidable struggle between the two opposing systems and the pursuit of changes in the "correlation of forces" in favor of the Soviet Union imply the possibility of war between them. Consequently, the Soviets see a critical need for an alternative to mutual assured destruction. The Soviet Union, therefore, has focused on the first proposition that nuclear weapons are "decisive" and can be used to achieve victory, and have tried to negate the second proposition by means of a war survival program. Indeed, the Soviets see their solution of the second proposition as serving to reinforce the first one and as resolving the dilemma posed by them. Therefore, from their perspective the Soviets have developed a balanced and integrated war-fighting posture and strategy which combines the objective of defeating the enemy with the Soviet Union's unilaterally assured survival. As the Soviets see it, this helps to protect them against the uncertainties of the "struggle" between the two systems, provides them with a more realistic and credible posture in the nuclear age, makes possible the development and, if need be, pursuits of rational war aims, and preserves the political and military utility of Soviet military power.

Since the Russian Revolution the Soviet Union has been constantly concerned not only with its national survival, but also with a global triumph of the Soviet system. Therefore, it is natural and logical for the Soviet leadership to see civil defense as an "integral" part of the Soviet military posture and war-fighting capability and to assess it as a "factor of strategic significance" which potentially may have a "decisive" influence on the course and outcome of a war. The Soviets are also aware that as a system in Soviet defense capabilities, civil defense has a very low rate of obsolescence. For example, a Soviet shelter built in 1959, if properly equipped and maintained, is likely to be just as effective as a shelter of similar hardness built in 1980.

Many long standing civil defense measures, such as the evacuation and dispersal of urban populations, already extensively practiced during World War II, continue to retain their utility for reducing human losses, even at the present time.

Beyond this, the Soviets have been much schooled in surviving and maintaining the rudiments of organized life under the most trying conditions of physical destruction and trauma. The civil war period from 1917 into 1921 saw an almost complete disintegration of regular means and norms of life, but with a ruthless system of organizing and utilizing power under the rubric of "war communism" a tiny new elite of rulers was able not only to survive, but to establish absolute dominion over a vast empire and some 150 million people. World War II brought the loss or devastation of more than one half of the economic resources of the USSR and the dislocation of tens of millions of people, but again through the unstinted use of power and regulatory authority massive war-fighting capabilities were retained and steadily increased to the point needed for both complete victory and a rapid post-war restoration. The costs in each of these cases were astronomical in human terms, but from the standpoint of the ruling regime they proved bearable. While the Soviet leadership doubtless appreciates that destruction from a nuclear war can well be of a different order of magnitude from anything it has previously experienced, still its outlook toward even this sort of destruction is evidently tempered by its survival of these past experiences, and all the more so since it has for so long been deliberately preparing itself and its people for what it conceives to be the worst that may be posited to it.

In any event, the Soviets give every indication of persisting in their belief in the correctness of their solution of the nuclear dilemma. Consequently, they also make clear that they will continue their efforts and investments to further improve Soviet Civil Defense capabilities. It becomes increasingly important, therefore, that account be taken of the nature, scope and effectiveness of Soviet Civil Defense measures and their implications for U.S. retaliatory strategy.

I. THE STRATEGIC DIMENSIONS OF SOVIET CIVIL DEFENSE

A. SOVIET VIEWS ON THE ROLE AND UTILITY OF CIVIL DEFENSE

1. Introduction

Ever since its inception the Soviet Union has believed that it exists in a permanent state of threat of war. This belief follows logically from Marxist-Leninist doctrinal concepts of the dialectic process in the relationship between states with opposing social-political systems, i.e., communist and capitalist, and of the historically ordained direction of human development. The view that "the world outlook and class aims of socialism and capitalism are opposed and irreconcilable"¹ has been and remains fundamental to Soviet doctrine and perceptions as well as to its approach to international relations. Equally fundamental to Soviet doctrine is the concept of the class nature of war and war aims and the Clausewitzian view of war, including nuclear war, as a continuation of politics of the "ruling classes" and as an instrument of their policies.

Prior to the Soviet acquisition of a nuclear capability, the Soviet leadership was guided by Lenin's belief, which he advanced in 1919, that:

We live not merely in a state but in a system of states, and the existence of the Soviet Republic side by side with imperialist states for a long time is unthinkable. One or the other must triumph in the end. And before that end supervenes, a series of frightful collisions between the Soviet Republic and the bourgeois states will be inevitable.²

Soviet acquisition of nuclear weapons, which, the Soviets claimed, threatened the survival of capitalism in a war with the Soviet Union, led Khrushchev to declare in February 1956 that the war predicted by Lenin was no longer "fatalistically inevitable."³

¹ L. I. Brezhnev, Pravda, December 22, 1972.

² V. I. Lenin, "Report of the Central Committee at the 8th Party Congress," Selected Works, Vol. VIII (New York: International Publishing House, 1943), p. 33. Emphasis added.

³ N. S. Khrushchev, Speech at the 20th CPSU Congress, Pravda, February 15, 1956.

Even so, Khrushchev warned that war between the opposing systems remained possible.

Khrushchev's assessment and warning have continued to be shared by his successors.⁴ They continue to assert that although Soviet military might and favorable changes in the "correlation of world forces" have "forced" the U.S. to agree to "peaceful coexistence" with the Soviet Union and reduced the danger of war, the possibility of its occurrence continues to require Moscow to prepare for it. For example, Brezhnev has said that "we are realists...we know full well that wars and acute international crises are far from being a matter of the past" and that it would be "dangerous" to believe that the "threat of war has become illusory."⁵ The persistent danger of war has continued to be a major theme in the pronouncements of Soviet political and military leaders.

Of course, Soviet leaders do not expect at all times an imminent outbreak of war. But their assertions that "one must not underestimate the danger of war arising from imperialism"⁶ is not illogical in the light of Soviet characterization of present international relations. The Soviets claim to see the present period as one of "struggle between opposing social systems," of "unrelenting" offensives by communist and progressive forces against capitalist interests and positions in the world, and of "social and national liberation." Furthermore, the Soviets insist that "peaceful coexistence" is intended to facilitate "the development of the world revolutionary process" and that it in no way serves to maintain international political stability. Naturally, the Soviets expect that the capitalist states will attempt to resist.

⁴For example, see M. Suslov, "Marxism-Leninism and the Revolutionary Renovation of the World," Kommunist, No. 14, September 1977, p. 23.

⁵L. I. Brezhnev, Pravda, October 27, 1973 and July 22, 1974. See also Radio Moscow, February 20, 1975 and Pravda, February 25, 1976. See also Lieutenant General P. Zhilin, "On Guard Over Peace and Socialism," Mezhdunarodnaya Zhizn', (International Affairs), No. 2, February 1978, p. 23; Major General N. Sushko and Lieutenant Colonel V. Kozlov, "The Development of Marxist-Leninist Teaching on War and the Army," Voennaya Mysl' (Military Thought), No. 4, April 1968, FPD Translation No. 0052/69, May 25, 1969, p. 95.

⁶Marshal of the Soviet Union N. Ogarkov, "On Guard Over the Interests of the Soviet Motherland," Partiinaya Zhizn' (Party Life), No. 4, February 1979, p. 26.

From the Soviet viewpoint, future relations with the Western powers are always fraught with uncertainties. Even while further changes in the "correlation of forces" in favor of the Soviet Union may limit the West's freedom of action, it may, in the Soviet view, also stimulate the "capitalists" to resort to force in desperation. The former Politburo member and USSR Minister of Defense, Marshal of the Soviet Union A. Grechko, said in this connection:

The course of modern social development confirms the idea expressed by Lenin that the more substantial socialism's victory is, the more stubborn becomes the resistance of the international bourgeoisie. Not wishing to reckon with the lessons of history, imperialist reaction seeks a way out in various kinds of adventures and provocations and in direct use of military force.⁷

From the Soviet viewpoint, therefore, reliance on "the peace aspirations of the imperialists" would be foolhardy. Instead, the Soviets must rely on the "real correlation of forces, on the economic and military might"⁸ of the Soviet Union and on the readiness of the Soviet armed forces and of the country as a whole for waging war and "crushing" the potential enemy. Here again the Soviets are fond of Lenin's dictum to the effect that one must prepare for war "seriously, or not at all."

As seen from the vantage point of Marxist-Leninist doctrine, wars between states with opposing social-political systems are expected to be especially fierce and uncompromising. The war aims of the belligerents in such conflicts would include the destruction of the adversary's social-political system. Thus, each side will be concerned not only with avoiding military defeat but with the preservation of its system.⁹ Consequently, along with offensive operations defensive efforts to limit damage to one's own country becomes an essential element of Soviet war aims. Another equally

⁷A. Grechko, Krasnaya Zvezda (Red Star), April 18, 1970. See also his statements in Krasnaya Zvezda, July 12, 1972, and Komsomolets Tatarii (Komsomol of the Tartar Republic), January 9, 1974.

⁸Grechko, Komsomolets Tatarii, January 9, 1974.

⁹Major General A. S. Milovidov, editor, The Philosophical Heritage of V. I. Lenin and the Problems of Contemporary War (Moscow: Voenizdat, 1972), translated by the U.S. Air Force (Washington, D.C., U.S. Government Printing Office), p. 216.

important reason for Soviet interest in defensive damage-limiting capabilities is the belief that successful war fighting requires ongoing material and moral support by the country as a whole. "It is impossible," wrote Grechko, "to conduct a war without a reliable and functioning home front."¹⁰

The appearance of nuclear weapons and of means of delivering them to any target on the belligerents' territories has made it more important than hitherto to "calculate more scrupulously not only the damage which would be inflicted on the enemy but also the damage suffered" by one's own country.¹¹ In the Soviet view, therefore, the destructiveness of the new offensive strategic systems does not negate, but on the contrary, increases the importance of damage-limiting capabilities. Soviet spokesmen note the dynamic interaction of offense and defense and that "the rapid development of missile-nuclear weapons has actively stimulated military-scientific thought and practice to develop ways and means to counter them."¹² The Soviets insist that without measures to protect the country, the destruction "in a short time" of military, economic, administrative and communication facilities and massive casualties among the population "can lead to the disorganization of all vital activities in the enemy nations, to a weakening of their organization and will to continue the struggle."¹³ Even more fundamental, "it is a question of the survival of the state during war, without which even successful combat actions may lose their importance."¹⁴

¹⁰ A. Grechko, Vooruzhennyye Sily Sovetskogo Gosudarstva (Armed Forces of the Soviet State), second edition (Moscow: Voenizdat, 1975), p. 114.

¹¹ Colonel V. Larionov, "The Transformation of the 'Strategic Sufficiency' Concept," SShA: Ekonomika, Politika, Ideologiya (USA: Politics, Economics, Ideology), No. 11, November 1971, p. 28.

¹² Marshal of the Soviet Union N. Ogarkov, "Military Science and the Defense of the Soviet Fatherland," Kommunist, No. 7, May 1978, p. 117.

¹³ Colonel General M. A. Lomov, editor, Scientific-Technical Progress and the Revolution in Military Affairs (Moscow: Voenizdat 1973), translated by the U.S. Air Force (Washington, D.C., U.S. Government Printing Office), pp. 137-138. See also Marshal of the Soviet Union V. D. Sokolovskiy, Voennaya Strategiya (Military Strategy), third edition (Moscow: Voenizdat, 1968), pp. 297, 333.

¹⁴ Lieutenant General M. Gareyev, "Military Science as an Important Factor of Defense Potential," Soviet Military Review, No. 12, December 1976, p. 16.

Civil defense, therefore, has been a part of the Soviet defense posture since the early years of the existence of the Soviet Union. Its character and scope naturally have changed with the nature of the threat posed by the development of offensive weapons. Consequently, it evolved from a program initiated in the 1920s for protecting populated centers and important economic installations in the border regions of the Soviet Union, to protection of likely target cities and installations within reach of the German forces during World War II, to the present comprehensive, countrywide system established in 1961.¹⁵ Neither the rapid increase in the number of U.S. warheads nor the signing of the SALT agreements and the advent of detente in U.S.-Soviet relations have diminished Soviet interest in developing a civil defense capability. On the contrary, the arms control agreements reached in 1972 appear to have stimulated more intensive Soviet efforts in the implementation of the civil defense program. Soviet spokesmen insist that such a program "is an objective necessity" and an "important task of the state and of the whole people" which will be continued and improved regardless of any objections from the West.¹⁶ Brezhnev has personally indicated the ongoing commitment of the Soviet leadership to the civil defense program, most recently in May 1978.¹⁷

When considering the overall role and utility of civil defense, the Soviets see it relating to the credibility of their strategic posture, the effectiveness of their deterrence, as well as an essential element in war fighting, successful war outcome and post-war recovery.

2. Civil Defense and the Credibility of the Soviet Strategic Posture

Just as other elements of Soviet strategic defense such as the Air Defense Troops, the Soviets view civil defense as a

¹⁵ See Army General A. Altunin, "Local Anti-Air Defense (MPVO)," Sovetskaya Voennaya Entsiklopediya (Soviet Military Encyclopedia), Vol. 5 (Moscow: Voenizdat, 1978), pp. 253-254, and in "The Principal Stages and Direction of Development of USSR Civil Defense," Voenno-Istoricheskiy Zhurnal (Military-Historic Journal), No. 11, November 1976, pp. 39-47.

¹⁶ Army General A. Altunin, "In Defiance of Logic," Krasnaya Zvezda, February 3, 1978.

¹⁷ L. I. Brezhnev, answers to questions by Vorwaerts (FRG), TASS, Moscow, May 2, 1978.

"component part of our /i.e., Soviet/ military might,"¹⁸ which occupies an important place in "strengthening the defense capability of our /i.e., Soviet/ state."¹⁹ Civil defense, it is noted, is an integral part both of the Soviet Union's overall defense measures and of its "strategic planning."²⁰ This is so because the might of the Soviet armed forces is said to be "directly dependent on the complete readiness and efficient operation of the rear of the country."²¹ This applies in particular to the ability of the economy and transportation to provide essential support for the armed forces and thereby help assure the success of military operations. No less important is said to be the contribution of civil defense to the "ideological and moral-psychological preparation of the country's population for the possible trials of a war," which makes it possible to resist the opponent's nuclear "blackmail" and in wartime maintain the people's will to fight on to victory.²² "Consequently," as the former Chief of the General Staff put it

¹⁸ Lieutenant General D. A. Krutskikh, editor, Uchebno-Metodicheskoe Posobie po Podgotovke Rukovodyashchego i Komandno-Nachal'stvuyaschego Sostava Grazhdanskoi Oborony (Study-Methodological Manual for the Training of the Chiefs and Command-Leadership Element of Civil Defense) (Moscow: Voenizdat, 1978), p. 8.

¹⁹ Colonel General V. Grekov, "Defense of Peaceful Labor," Sovetskiy Patriot (Soviet Patriot), April 7, 1976.

²⁰ Marshal of the Soviet Union V. D. Sokolovskiy and Major General M. Cherednichenko, "Military Strategy and Its Problems," Voennaya Mysl' (Military Thought), No. 10, October 1968, FPD Translation 0084/69, September 4, 1969, p. 38; Grechko, Vooruzhennyye Sily Sovetskogo Gosudarstva, pp. 113-115; Lomov, Scientific-Technological Progress, p. 134.

²¹ Colonel General O. Tolstikov, "Civil Defense in Nuclear-Rocket War," Voennaya Mysl', No. 1, January 1969, FPD Translation No. 939, August 4, 1965, p. 28. See also Marshal of the Soviet Union, V. I. Chuikov, Grazhdanskaya Oborona v Raketno-Yadernoi Voine (Civil Defense in a Nuclear Missile War) (Moscow: Atomizdat, 1969), p. 13; Grechko, Vooruzhennyye Sily Sovetskogo Gosudarstva, p. 115.

²² Colonel S. Tyushkevich, "The Development of the Doctrine on War and the Army on the Basis of the Experience of the Great Patriotic War," Kommunist Vooruzhennykh Sil (Communist of the Armed Forces), No. 22, November 1975, p. 15; Lomov, Scientific-Technical Progress and the Revolution in Military Affairs, p. 194; Milovidov, The Philosophical Heritage of V. I. Lenin..., p. 195; Grechko, Vooruzhennyye Sily Sovetskogo Gosudarstva, p. 116.

Civil defense has important significance for the questions relating to the preparation of the country for defense. Acting jointly with all types of our Armed Forces and under single military command, it assures the viability of the state under conditions of modern war.²³

The Soviets, as was noted, recognize that resort to nuclear weapons can threaten not only a state's ability to wage war but also its very survival. They also reject the American concept of a balance of mutual assured destruction.²⁴ In their view credible strategic posture does not depend solely on the potential damage it can inflict on the enemy. Indeed, having chosen to develop a war-fighting rather than pure deterrence posture, its credibility depends on making possible resort to it seem rational. As the Soviets see it, a strategic posture which at best poses a threat of mutual suicide is of limited utility and lacks credibility. The Soviets argue that "no country can set itself the aim of defeating the enemy at the cost of its own destruction."²⁵ The Soviet strategic posture, therefore, must be able to prevent such destruction and deny to the enemy the ability to threaten such an outcome. Consequently, damage-limiting capabilities are seen as having a direct bearing on the balance of forces as well as on the likely outcome of a war. For example, it is asserted that civil defense "does exert effective influence on change in the overall balance of forces of the belligerents, on the course of the war as a whole."²⁶ Along the same

²³ Army General V. G. Kulikov, "A Great National Cause," Voennye Znaniya (Military Knowledge), No. 5, May 1974, p. 3.

²⁴ For example, see interview with N. N. Yakovlev in "200 Years of the United States and the Present," Mlada Fronta (Prague) April 29, 1976; D. Proektor, "Military Detente-A Paramount Task," Mezhdunarodnaya Zhizn', No. 2, May 1976, p. 56; Colonel V. Khrobostov and Lieutenant Colonel V. Gorbunov, "Pivotal Problem of Our Times," Soviet Military Review, No. 1, January 1978, p. 61; V. F. Petrovskiy, "Evolution of the Doctrine of 'National Security,'" SShA: Ekonomika, Politika, Ideologiya, No. 11, November 1978, pp. 12-24; L. Semeyko, "Imperialism's Strategic Concepts," Krasnaya Zvezda, March 24, 1979.

²⁵ A. Arbatov, "Strength-Policy Impasse," Soviet Military Review, No. 1, January 1975, p. 46.

²⁶ Milovidov, The Philosophical Heritage of V. I. Lenin..., p. 244. In his article in Krasnaya Zvezda, February 3, 1978, Army General A. Altunin asserted that Soviet civil defense "does not and cannot upset the 'Soviet-American balance of forces.'"

line, it is said that "the preparation of the country's rear for defense against means of mass destruction has become, without a doubt, one of the decisive strategic factors ensuring the viability of the state in wartime, and in the final analysis, the attainment of victory in war."²⁷ Or again:

In conditions when the rear, as the national basis of the country's defense potential, becomes one of the main objectives of enemy attack, civil defense acquired the significance of a strategic factor....

Today the reliable defense of the population and national economy in conditions of war is an important factor of the country's defense potential.²⁸

From the Soviet viewpoint, therefore, the greater the threat to the survival of the state and its war fighting capabilities, the more critical become active and passive defense measures as elements of a credible strategic posture. If in the bomber age civil defense was a useful but not essential factor in Soviet overall military capabilities, in the nuclear age it has become a "strategic factor," which, according to Soviet spokesmen, directly bears on the Soviet Union's overall defense capabilities and readiness for war.

3. Civil Defense and Soviet Deterrence Capabilities

Given that the struggle between the two opposing systems may lead to war, Soviet military power was and continues to be seen as critical for deterrence of war initiation by the West against the USSR and its allies as well as for the safe pursuits of Soviet foreign policy objectives. In view of the class character of East-West relations, effective Soviet deterrence of aggression must be based on the "objective conditions" and primarily on a correct assessment of the "correlation of forces." At the foundation of the "correlation of forces," however, lies military power. This is so because, of the nature of the rivalry between the opposing systems and because, as the Soviets claim, "the lessons of history teach us

²⁷ Colonel General A. Altunin, "Civil Defense Today," in Lyudi i Dela Grazhdanskoi Oborony (People and Affairs of Civil Defense) (Moscow: Voenizdat, 1974), p. 5. See also Krutskikh, Uchebno-Metodicheskoe Posobie, p. 15.

²⁸ Colonel V. Ryabchikov, "Civil Defense of the USSR," Soviet Military Review, No. 2, February 1977, pp. 46-47. See also Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 115; Army General V. G. Kulikov, "Guarding the Achievements of Socialism," Voennye Znaniya, No. 5, May 1976, p. 2.

that imperialists heed only force."²⁹ Consequently, the greater the credibility of Soviet military power as perceived by the potential enemies of the Soviet Union, the more effective its ability to deter these enemies will also be.³⁰

The primary element of effective deterrence is seen by the Soviets as the capability to threaten the survival of the Western and, in particular, the U.S. capitalist system. This threat, as Khrushchev noted in 1956, became credible with the development by the Soviet Union of strategic nuclear forces. The subsequent evolution of U.S.-Soviet relations to peaceful coexistence and SALT is claimed by the Soviets to be a direct result of the growth of Soviet strategic deterrence capabilities which "forced" the U.S. to adjust its policies to the new military realities.³¹ It is asserted that:

The leaders of imperialist powers are obliged to reckon with the fact that a global war unleashed against the socialist countries would now amount to suicide for the capitalist system.³²

Consequently, the Soviets would like the "imperialists" to believe that,

²⁹ Grechko, Komsomolets Tatarii, January 9, 1974.

³⁰ Ibid.; D. Ustinov, Speech on the 60th anniversary of the October Revolution, Radio Moscow, November 7, 1977; L. I. Brezhnev, Speech at the CPSU Central Committee Plenum, Pravda, October 26, 1976.

³¹ For a discussion of Soviet views on the influence of Soviet military power on U.S. policies see F. D. Kohler, M. L. Harvey, L. Goure and R. Soll, Soviet Strategy for the Seventies: From Cold War to Peaceful Coexistence (Washington, D.C.: Advanced International Studies Institute, 1973), passim.

³² V. Kortunov, "The Leninist Policy of Peaceful Coexistence and Class Struggle," Mezhdunarodnaya Zhizn', No. 4, April 1979, p. 94. See also L. Goure, F. D. Kohler and M. L. Harvey, The Role of Nuclear Forces in Current Soviet Strategy (Washington, D.C.: Advanced International Studies Institute, 1974), pp. 25-36; V. Zagladin, "Revolutionary Era of October," Pravda, November 6, 1978.

... having built up a huge military potential, they are unable to use it to attain their military-strategic and political goals, whether regional or global, as this holds out the threat of their own destruction.³³

The deterrence effect of the Soviet threat to destroy the U.S. would be obviously reinforced if the Soviet Union could deny to the U.S. the ability to threaten it in its turn with assured destruction. It is said that "the defense potential of the Soviet Union is called upon to inspire in the aggressors an understanding of the inevitable failure of their political and strategic goals."³⁴ Specifically, therefore, the Soviet civil defense program, both by strengthening the credibility of the Soviet strategic posture and by helping to "significantly" limit the damage U.S. strikes may inflict on the USSR, is seen as reinforcing Soviet deterrence capabilities. It is claimed, therefore, that:

Improvement of Soviet civil defense and an increase in its effectiveness constitutes one more major obstacle in the way of the unleashing of a new world war by the imperialists. Consequently, Soviet civil defense intensified the peaceful actions taken by our state and strengthens international security as a whole.³⁵

Similarly, Soviet spokesmen have asserted that "the readiness of our Soviet economy for a possible imperialist war," which depends to a great extent on civil defense measures, "represents an important factor for restraining the expansionist aspirations of imperialist aggressors."³⁶

³³ D. Proektor, "Military Detente: Primary Task," International Affairs (Moscow), No. 6, June 1976, p. 37.

³⁴ Zhilin, Mezhdunarodnaya Zhizn', No. 2, February 1978, p. 26. See also Major General S. Tyushkevich, "The Fruits of Constructive Labor Under Conditions of Reliable Defense," Kommunist Vooruzhennykh Sil, No. 11, June 1976, p. 12.

³⁵ Milovidov, The Philosophical Heritage of V. I. Lenin..., p. 251.

³⁶ Major General M. Cherednichenko, "Modern War and Economics," Kommunist Vooruzhennykh Sil, No. 18, September 1971, p. 25.

On the whole, however, the Soviets have not gone out of their way to single out the deterrence role of civil defense. This role is implied rather than specifically emphasized in Soviet claims that civil defense can achieve "significant reduction" in human and national losses from enemy nuclear strikes and that it makes an important contribution to the attainment of a Soviet victory in a nuclear war. Along the same lines, the Soviets have pointed out the lack of effective civil defense measures in the U.S. and the high concentration of industry, including defense industry, in a comparatively small number of large industrial centers in the U.S. which increases the vulnerability of the U.S. economy to attack.³⁷ In response to American concern in recent years that Soviet civil defense measures may adversely affect the U.S.-Soviet strategic balance, Soviet public pronouncements have tended to be reassuring. Possibly in order to prevent this question from becoming an issue in SALT or stimulating new U.S. defense programs, the Soviets have been arguing that these measures are purely humanitarian in character and intent and pose no threat to the West's security.³⁸

The increases in the credibility of Soviet military power and deterrence capability are seen by Moscow as facilitating the pursuit of an active foreign policy and support of revolutionary and national liberation movements and Soviet client states. The Soviets claim that growing Soviet military might serves to limit the West's "export of counterrevolution" and reduces the risks of Western military responses to such Soviet activities. According to Soviet spokesmen:

The Soviet armed forces...are serving as a support for the peoples who are struggling for their national and social freedom and they are furthering the successful development of the national liberation movement and accomplishment

37

For example, see Captain Second Rank B. G. Grigor'ev, Ekonicheskie i Moral'nye Potentsialy v Sovremennoi Voine (Economic and Moral Potentials in Contemporary War) (Moscow: Voenizdat, 1970), p. 76; Captain Second Rank V. Yakovlev, "Imperialism--The Enemy of Peoples and Social Progress," Kommunist Vooruzhennykh Sil, No. 14, July 1975, p. 70.

38

For example, see Altunin, Krasnaya Zvezda, February 3, 1978; Brezhnev, TASS, Moscow, May 2, 1978.

of the task of preventing the export of counterrevolution to the liberated countries.³⁹

Or again:

The economic and military might of the socialist community fulfills an important historic function: to fetter imperialism, restrict its opportunities for export of counterrevolution, to assure the security of world socialism.⁴⁰

The Soviets claim that the national liberation struggle of peoples in the less developed countries has been significantly facilitated and accelerated by the growing capabilities of the Soviet Union to deter the West's resort to force. Furthermore, the Soviet Union has been increasingly able to directly assist the revolutionary and "anti-imperialist national liberation movements."

Oppressed and dependent nations waging wars of liberation /are/ no longer alone in the struggle against colonizers. They receive moral, political, economic and, where possible and necessary, military assistance from countries of socialism.⁴¹

Brezhnev and other Soviet leaders have repeatedly made public commitments of such Soviet support, which is said to be "one of the

³⁹N. S. Rubanov, "The Army's Place in the Political System of Developed Socialism," Vestnik Moskovskogo Universiteta; Seriya Teoriya Nauchnogo Kommunizma (Herald of the Moscow University; Series on Theory of Scientific Communism), No. 1, January-February 1977, p. 45. See also Major General D. Volkogonov, "Class Struggle and the Present," Kommunist Vooruzhennykh Sil, No. 4, February 1979, pp. 11-12; Colonel Ye. Rybkin, "The 25th CPSU Congress and Wars of Liberation in the Contemporary Era," Voenno-Istoricheskiy Zhurnal, No. 11, November 1978, pp. 10-17; Colonel V. Khalipov, "The Combat Alliance of Internationalists," Krasnaya Zvezda, July 12, 1979.

⁴⁰Zhilin, Mezhdunarodnaya Zhizn', No. 2, February 1978, pp. 25-26.

⁴¹Rybkin, Voenno-Istoricheskiy Zhurnal, No. 11, November 1978, p. 15.

paramount principles" of Soviet foreign policy.⁴² As primary examples of such assistance the Soviets cite Vietnam, Angola, Ethiopia and Afghanistan.

The requirement for an effective Soviet deterrence capability in support of policy aimed at changing the political status quo and the correlation of forces in the world is evident.⁴³ Thus, to the extent that civil defense contributes to the credibility of Soviet military power and to its overall deterrence capabilities, it is also seen by the Soviets as helping to reinforce Soviet deterrence of Western military actions in response to direct or indirect local Soviet challenges. As noted above, the "imperialists" are said to be unable to attain their regional military or political objectives because they risk provoking a confrontation with the Soviet Union and the possibility of their own destruction.

4. Civil Defense and War Fighting

Civil defense makes its most important contribution to war fighting. This is so because it helps to assure the viability of the state and its continuing functioning in wartime, provides protection for the population and the economy and thereby assures continuing support for the war effort.

While it is asserted that human and economic resources are "the most important factors determining a country's military strength,"⁴⁴ Soviet spokesmen, as was noted, also warn that the losses and damage from nuclear strikes could preclude effective waging of the war.⁴⁵

⁴² For example, see Brezhnev's speech at the 25th CPSU Congress, Pravda, February 25, 1976; M. Suslov's speech on the 105th Anniversary of Lenin's Birth, Radio Moscow, April 22, 1975.

⁴³ For example, see Kortunov, Mezhdunarodnaya Zhizn', No. 4, April 1979, p. 110; Volkogonov, Kommunist Vooruzhennykh Sil, No. 4, February 1979, pp. 11-13; A. Sovetov, "The Contemporary World and Detente," Mezhdunarodnaya Zhizn', No. 5, May 1979, pp. 3-16.

⁴⁴ Major V. Goncharov, "U.S. Public Civil Defense Training," Zarubezhnoe Voennoe Obozrenie (Foreign Military Review), No. 7, July 1978, pp. 98-102. See also Major Generals D. A. Volkogonov, A. S. Milovidov and S. A. Tyushkevich, Voyna i Armiya (War and the Army) (Moscow: Voenizdat, 1977), pp. 165-194.

⁴⁵ Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 114; Kulikov, Voennye Znaniya, No. 5, May 1974, p. 3; Krutskikh, Uchebno-Metodicheskoe Posobie, p. 13.

Furthermore, it is argued that the "power" of the Soviet armed forces "is directly dependent on the complete readiness and efficient operation of the rear of the country" in wartime, and that "the solution of many military problems depends to a degree on the thoroughness of the manner in which civil defense measures are carried out."⁴⁶ Civil defense, it has been claimed, "will give invaluable aid to the Soviet Armed Forces in achieving victory over the enemy."⁴⁷ In the words of the former chief of USSR Civil Defense, Marshal of the Soviet Union Chuikov:

In our time the defensive might of a state is determined not only by the readiness of the armed forces to wage war but also by the ability to assure in the course of war a level of industrial and agricultural production sufficient for its successful conduct.⁴⁸

In brief, therefore, civil defense is seen as playing an important role in assuring essential support for military operations and the capabilities of the armed forces in general and in preserving effective command and control as well as the morale of the population. Consequently, it is claimed:

Today, without civil defense it is impossible to withstand the rigorous trials which are inevitable with enemy use of nuclear missiles, chemical and bacteriological mass destruction weapons; it is impossible without civil defense to protect the population and the nation's economy. Civil defense is becoming a strategic factor which is of substantial

⁴⁶ Colonel General O. Tolstikov, Voennaya Mysl', No. 1, January 1964, FDD Translation No. 939, August 4, 1965, p. 28. See also Altunin, Sovetskaya Voennaya Entsiklopediya, Vol. 3, p. 24.

⁴⁷ Colonel N. Bašov, "The Class Essence of Civil Defense," Kommunist Vooruzhennykh Sil, No. 22, November 1970, p. 28; Milovidov, The Philosophical Heritage of V. I. Lenin..., p. 250.

⁴⁸ V. I. Chuikov, Grazhdanskaya Oborona v Raketno-Yadernoi Voine, p. 13. See also G. K. Kotlukov, Yu. A. Lebedeva and L. I. Gorelov, Grazhdanskaya Oborona (Civil Defense) (Moscow, Prosveshchenie, 1976), translated by the Defense Civil Preparedness Agency, p. 2.

determining influence on the course and outcome of a modern war, as well as postwar restoration of the economy.⁴⁹

Civil defense measures are said to also be necessary because of what are claimed to be the U.S. strategic objectives and targeting doctrine in the event of a war. Soviet spokesmen claim that the U.S. threat of "assured destruction" of the Soviet Union includes the killing "of many millions" of Soviet civilians, the destruction of up to 80 percent of industry and of "at least 200 of the largest cities."⁵⁰ It is also said that:

According to the statement of the former U.S. Secretary of Defense, McNamara, the minimum limit of "unacceptable damage" should be the destruction of one-third of the Soviet population and from one-half to two-thirds of the industrial potential.⁵¹

Soviet spokesmen claim that the "military leadership of the aggressive blocs has set itself the aim of suppressing the vital activities of our state, disrupting the administration of the country, undermining the military-economic potential, thwarting the deployment of the armed forces, and seizing the strategic initiative in the war."⁵²

According to Soviet statements, therefore, the stability and reliable operations of the country are persistently linked with the effectiveness and success of operations of the armed forces. It is asserted that successful war fighting is "impossible" without damage-limiting capabilities and consequently, that civil defense can significantly influence the course of the war.

⁴⁹ Milovidov, The Philosophical Heritage of V. I. Lenin..., p. 240. See also Altunin, Lyudi i Dela Grazhdanskoi Oborony, p. 6.

⁵⁰ Colonel General O. V. Tolstikov, KPSS o Neobkhodimosti Sovershenstvovaniya Grazhdanskoi Oborony (The CPSU on the Need to Perfect Civil Defense) (Moscow: Atomizdat, 1969), p. 7. See also Secretary of Defense Harold Brown, Defense Department Annual Report for FY 1979 (Washington, D.C.: Department of Defense, February 2, 1978), p. 55.

⁵¹ Lomov, Scientific Technical Progress..., p. 254.

⁵² P. T. Egorov, I. A. Shlyakhov and N. I. Alabin, Grazhdanskaya Oborona (Civil Defense), third revised edition (Moscow: Vysshaya Shkola, 1977), p. 8.

5. Civil Defense and Successful War Outcome

Given that in the Soviet view civil defense is an essential element of an effective war-fighting capability, it is also claimed to be an important factor in achieving "victory" in a nuclear war. Although this line is most forcefully stated by spokesmen connected with USSR Civil Defense, this view logically follows both from Soviet doctrine on requirements for waging a successful war and Soviet stated belief in the possibility of winning a nuclear war. According to Altunin:

Under present conditions...the preparation of the country's rear for defense against means of mass destruction has become, without a doubt, one of the decisive strategic factors ensuring the ability of the state to function in wartime, and in the final analysis, the attainment of victory.⁵³

Or again it is claimed that "under modern conditions, ensuring the viability of the state in peacetime and, in the final analysis, victory in war, depends upon the timely, comprehensive and purposeful preparation of the rear of the country."⁵⁴

Specifically, the Soviet view is that superior damage limitation is a critical factor in determining a war outcome and in assuring that the side that can do so emerges from the war in a stronger position than its adversaries.

The side which can preserve to the greatest extent its production forces and their base--the people--ensuring the steady work of administrative organs, important industrial facilities and transportation and protect the bases for supplying food and raw materials can be victorious in such a war.⁵⁵

As was noted, Soviet spokesmen argue that even if the Soviet armed forces were able to conduct successful operations, this would lose its significance in the event that the Soviet Union as a state

⁵³ Altunin, Voennye Znaniya, No. 12, December 1973, pp. 4-5. See Altunin, Lyudi i Dela Grazhdanskoi Oborony, p. 5.

⁵⁴ Krutskikh, Uchebno-Metodicheskoe Posobie, pp. 14-15.

⁵⁵ M. Badazhanov and N. Lugovoi, "To Increase Readiness and To Be Ready," Kommunist Tadzhikistana (Tadzhik Communist), December 29, 1970. See also Kotlukov et al., Grazhdanskaya Oborona, p. 2; Tolstikov, Voennaya Mysl', No. 1, January 1964, FDD Translation No. 939, August 4, 1965, p. 35.

is destroyed. Consequently, there can be no meaningful "victory" without the survival of the Soviet Union as a functioning system and capable of preserving the superiority of Soviet military power.

6. Civil Defense and Postwar Recovery

Soviet publications pay relatively little attention to the postwar recovery problem. Even so, the significance of civil defense for the solution of this problem is obvious. By limiting damage to Soviet political and economic control systems, the economy and the population, especially essential personnel, the Soviet Union improves its ability to recover from a nuclear war. Furthermore, such recovery will be facilitated by the capabilities and readiness of civil defense to repair and restore damaged economic facilities, transportation, utilities and services. Indeed, this is one of the main missions of the massive Soviet civil defense forces. Similarly, recovery will be facilitated by civil defense measures to protect industrial facilities and transportation in the other Eastern European countries.

Soviet strategic planning is said to deal with the problem of the "rehabilitation" of the economy following enemy nuclear strikes.⁵⁶ In particular, however, civil defense efforts will be focused on emergency repair and restoration of damaged facilities in the course of the war in order to sustain the war effort as well as achieve economic superiority over the adversaries during the conflict and at war's end. For example, it is said that:

A war will evidently involve some degree of restoration of important industrial complexes. Large segments of the population will be required to liquidate the effects of the nuclear weapons and to continue working in intact enterprises in order to support their country's economic strength, thus influencing the correlation of economic indices of the belligerent states in a favorable manner.⁵⁷

⁵⁶Sokolovskiy and Cherednichenko, Voennaya Mysl', No. 10, October 1968, FPD translation, p. 38.

⁵⁷Colonel M. P. Skirido, Narod, Armiya, Polkovodets (The People, the Army, the Commander) (Moscow: Voenizdat, 1970), p. 62. See also Colonel A. Sukhoguzov, "Problems of Viability of the Economy in Modern War," Kommunist Vooruzhennykh Sil, No. 3, February 1972, p. 13; Colonel L. Korzun, "Problems of Stability of Production," Voennye Znaniya, No. 10, October 1972, pp. 26-27; Egorov et al., Grazhanskaya Oborona, p. 12.

B. THE PLACE OF CIVIL DEFENSE IN SOVIET STRATEGY

1. Soviet Views on War Aims

Soviet perceptions of the place of USSR Civil Defense in Soviet strategy are determined by their views of the aims and character of a possible war between opposing systems, the nature of modern strategic weapons, and the requirements for waging such a war and achieving a favorable outcome.

The basic tenet and starting point which determines Soviet perceptions of war, including nuclear war, is that it is waged in pursuit of political objectives and that the character of the military action will be determined by these objectives. These objectives are dictated by the interests of and antagonisms between the ruling classes of the belligerent nations. From this it follows that a war between opposing systems is especially likely to have a "sharply pronounced class character," and that each side will "pursue the most decisive aims," i.e., the "total defeat" of the other. According to Soviet doctrine, in such a war both sides will strive to resolve, once and for all, the historic issue posed by the existence of two "irreconcilable" systems. For example, it is asserted that:

The difference in the essence of the possible world nuclear missile war will be determined, first, by its concrete political content and by the depth, volume and scope of the political aims. It will resolve not specific limited political interests, but a crucial historic problem, one affecting the fate of mankind. Never before has such a colossal problem formed the political content of war. This is one of the radical differences between the essence of nuclear missile war and that of all past and present wars.⁵⁸

Or again:

The diametrically opposed political aims of a future war, should one be unleashed by the imperialists against the socialist countries, will predetermine the uncompromising outcome, that is, the waging of military actions

⁵⁸ Colonel S. Tyushkevich et al., editors, Marxism-Leninism on War and the Army (Moscow: Progress Publishers, 1972), p. 45. See also Sokolovskiy, Voennaya Strategiya, p. 226.

until total victory over the aggressor is achieved. The decisiveness of the war aims in turn determines the decisiveness of combat action.⁵⁹

The availability of large numbers of nuclear weapons and strategic delivery systems has introduced a quantitatively different possibility from previous wars for achieving such "decisive" war aims. Resort to such weapons against enemy territory can now achieve the political as well as military defeat of the opponent. For example, it is said that:

Today's weapons make it possible to achieve strategic objectives very quickly. The very first nuclear attack on the enemy may inflict such immense casualties and produce such vast destruction that his economic, moral-political and military capabilities will collapse, making it impossible for him to continue the struggle, and presenting him with the fact of defeat.⁶⁰

Accordingly, Marshal of the Soviet Union V. D. Sokolovskiy, visualized the respective war aims and military actions as follows:

In a new world war, the imperialist bloc would strive for inflicting maximum destruction of the armed forces and the deep interior of socialist countries, for liquidating their social-political system and establish capitalist systems instead, and enslave the people of these countries.

The Soviet Union and the countries of peoples' democracy, in order to protect their socialist achievements, will be forced to adopt no less decisive aims directed toward total defeat of the armed forces of the enemy with simultaneous disorganization of his homeland, and toward

⁵⁹Colonel V. Savkin, "Characteristics of Modern Warfare," Voennyi Vestnik (Military Herald), No. 3, March 1974, p. 25.

⁶⁰Skirido, Narod, Armiya, Polkovodets, p. 97. See also Colonel A. Taran, "Leninist Theoretical Principles of Soviet Military Strategy," Voennaya Mysl', No. 6, June 1971, FPD Translation No. 0015/74, March 12, 1974, p. 46.

suppression of the enemy's will to resist and rendering aid to the people to free themselves from the yoke of imperialism.⁶¹

2. Interaction of Strategic Offense and Defense in Soviet Strategy

Given the similarity of the assumed war aims of both sides, their attainment depends simultaneously on the effectiveness of offensive strikes by one's own side and the denial to the enemy of success in his strikes. Soviet war aims, therefore, combine actions to "crush" the enemy with assuring Soviet national and system survival. Only this combination can assure a meaningful "victory" in an all-out nuclear war. At the same time, the Soviets point out that under modern conditions the protection of the home territory has become "an independent strategic task."⁶²

In their approach to this problem the Soviets in effect consider strategic offense and defense as the same rather than opposite sides of the coin. They are seen as mutually reinforcing both because strategic defense serves to sustain Soviet capabilities to conduct offensive operations until victory is achieved and because offensive strikes make a direct and highly important if not decisive contribution to Soviet national and system survival. Thus, according to a Soviet view of the interrelationship of offense and defense:

Offense and defense constitute a dialectic unity of opposites, which simultaneously both exclude and assume one another. They not only are interconnected, but also mutually penetrate one another and cannot exist separately.⁶³

Or again,

Offense and defense are interlocked. Offense always contains elements of defense, just as defense is impossible

⁶¹Sokolovskiy, Voennaya Strategiya, p. 226. See also Major General V. Prokhorov, "Principles of Troop Control in the Light of Requirements of Cybernetics," Voennaya Mysl', No. 5, May 1968, FPD Translation 0012/68, April 2, 1969, p. 51

⁶²Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 10.

⁶³Colonel I. A. Grudin, Dialektika i Sovremennoe Voennoe Delo (Dialectics and Modern Military Affairs) (Moscow: Voenizdat, 1971), p. 57.

without offensive actions. The conduct of an offensive operation properly cannot but contain elements of defense (air defense, anti-tank defense, defense against mass destruction weapons, etc.).⁶⁴

Naturally, therefore, civil defense is an integral part of the Soviet war fighting, war survival and war winning strategy.

Soviet spokesmen are quite explicit in stressing that the responsibility for assuring the survival of the Soviet Union and effective support for its war effort does not belong to civil defense alone. Indeed it has been pointed out that "civil defense alone is not capable of solving all the tasks of defending the population and national economy."⁶⁵ Instead, the protection of the Soviet Union is said to be the joint mission and responsibility of the armed forces and civil defense.⁶⁶ This combined strategy is described as follows:

While the Armed Forces will ensure the defense of the homeland through active means--by the destruction of the attack weapons themselves (missiles--at the launch sites, aircraft--at airfields, submarines--at sea), or by intercepting the means of destruction on their course to the target, Civil Defense, by carrying out defense measures to protect the rear, must attain the maximum weakening of the effects of destructive factors of modern weapons upon it.⁶⁷

The requirements for the Soviet strategic offensive forces to be ready to deliver a first "preemptive" counterforce strike is a persistent theme in Soviet public pronouncements and writings and is said to be a basic element of Soviet strategic doctrine.⁶⁸

⁶⁴ Milovidov et al., The Philosophical Heritage of V. I. Lenin..., p. 107 (Emphasis added).

⁶⁵ V. I. Chuikov, Rodina (Motherland), January 3, 1968.

⁶⁶ Army General A. Altunin, "The Valuable and Leading--Into Practice," Voennye Znaniya, No. 10, October 1978, p. 18.

⁶⁷ Krutskikh, Uchebno-Metodicheskoe Posobie, pp. 8-9. See also Altunin, Lyudi i Dela Grazhdanskoi Oborony, p. 7; Egorov et al., Grazhdanskaya Oborona, p. 10.

⁶⁸ For example, see L. Goure et al., The Role of Nuclear Forces in Current Soviet Strategy, pp. 102-112.

Along with this, the Soviets devote much attention and resources to their anti-air defense forces. These forces are called upon to "reliably" protect the Soviet Union and to be always in readiness to "repulse" any enemy attack.

In principle, the Soviets would prefer to rely on these active modes of defense for the survival of the Soviet Union. For example, some Soviet spokesmen have asserted that:

The most effective means of defending the country's population are effective actions aimed at destroying the enemy's offensive weapons, both in the air and on the ground at their bases.⁶⁹

Some have written about the desirability or even "necessity" for Soviet anti-air defense to be capable of "destroying every warhead, without exception, which penetrates into the interior of the country through air or from space."⁷⁰ Such absolute defense, however, does not exist, and as Marshal Ogarkov has noted, every improvement in active defense stimulates development in offensive systems to overcome it.⁷¹

The Soviets do not specifically discuss in open publications what success they expect to have in weakening U.S. nuclear strikes by means either of counterforce strikes or active defense. No doubt these expectations alter with changes in both Soviet and U.S. strategic capabilities. For example, they do not indulge in public discussions, as is done in the U.S., about the possibility that in the 1980s Soviet counterforce strikes may be able to destroy up to 90 percent of U.S. ICBMs in their silos. The best the Soviets claim is that their offensive and defensive operations would "significantly weaken" or "disrupt" enemy nuclear strikes.⁷² It is

⁶⁹Radio Blagoveshchensk, August 5, 1970.

⁷⁰Marshal of Aviation G. V. Zimin, ed., Razvitie Protivovozdushnoi Oborony (Development of Anti-air Defense) (Moscow: Voenizdat, 1976), p. 192.

⁷¹Ogarkov, "Military Science and the Defense of the Soviet Fatherland," p. 117.

⁷²For example, see Captain First Rank A. V. Basov in Boevoi Put' Sovetskogo Voenno-Morskogo Flota (The Combat Path of the Soviet Navy) (Moscow: Voenizdat, 1974), p. 491; Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, pp. 109-110.

acknowledged, therefore, that there is no "guarantee" that "a portion" of enemy missiles will not only survive but reach their targets.⁷³ Consequently,

A significant reduction in human casualties in this instance can be achieved only by carrying out an entire complex of civil defense measures. For this reason, civil defense holds an important place in the overall system of measures of the country's defense measures....⁷⁴

Indeed, given the destructive capabilities of nuclear weapons, it is asserted that only the "timely" implementation of civil defense measures and programs can prevent "a sharp decline in industrial production, disruption of economic ties between individual regions, the breakdown of transportation, means of control, energy systems, the disruption of cities and vast human and material losses."⁷⁵ Consequently, civil defense has become a "decisive strategic factor" precisely because it can make a critical contribution to the ability of the country to "withstand" the effects of a nuclear war and to the preservation of the viability of the state.⁷⁶

3. Civil Defense and Potential Damage Levels

While recognizing that a nuclear war would inflict great human losses and damage on the Soviet Union, this expectation in the Soviet view does not negate or diminish the strategic significance of civil defense. Unlike the U.S., the Soviets do not view this

⁷³For example, see Egorov et al., Grazhdanskaya Oborona, p. 10; Sokolovskiy, Voennaya Strategiya, p. 361.

⁷⁴Egorov et al., Grazhdanskaya Oborona, p. 10. (Emphasis added)

⁷⁵Krutskikh, Uchebno-Metodicheskoe Posobie, p. 13. See also Egorov et al., Grazhdanskaya Oborona, p. 10; Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 114.

⁷⁶Altunin, Voennye Znaniya, No. 12, December 1973, pp. 4-5; Milovidov, The Philosophical Heritage of V. I. Lenin ..., p. 240; Egorov et al., Grazhdanskaya Oborona, p. 10.

issue in terms of such concepts as "unacceptable damage," and they reject the desirability of security based on "mutual vulnerability."

The Soviets do not identify any specific level of potential damage to the USSR as being "unacceptable" and as negating the value of civil defense. From their viewpoint the question of whether or not particular levels of anticipated damage are "acceptable" or "unacceptable" is essentially political. It depends on the leadership's objectives and perceived trade-offs or options. Consequently there is no fixed value or level of damage which the Soviets would regard a priori as being "unacceptable" under all circumstances. In other words, the relationship of damage expectations to policy decisions is dynamic, not static. Furthermore, it changes continuously as a result of alterations in the perceived strategic capabilities between the Soviet Union and its potential enemies.

Soviet discussions of this problem do not start with the options which the Soviet Union may have or would consider prior to a war, but with the fact of the occurrence of the war itself. Once the war has become a fact, the objective is to win it, and one critical element of a meaningful "victory" must be national and system survival. The utility and role of civil defense, therefore, is determined in the context of and according to its contribution to war fighting and war winning.

The problem, as the Soviets pose it, is not how much damage the Soviet Union may suffer in the course of a nuclear war, although they are obviously not indifferent to it, but how to avoid defeat and win, i.e., how to prevent the collapse of the state and of its war effort. Thus, even while the Soviets reject the concept of "mutual assured destruction" as a policy and as an inevitable outcome of a war, they recognize that nuclear weapons make "assured destruction" feasible and that each side would attempt to inflict such destruction on the other. This possibility was recognized already in the early 1960s in Soviet military doctrine. According to the doctrine, the first nuclear strikes could determine the course and outcome of a war. Marshal of the Soviet Union V. D. Sokolovskiy wrote in 1962:

The very first mass nuclear assault by the aggressor may cause such losses in the rear and among the troops that the people of the country will be placed in an extremely serious situation. Therefore, not only is a high degree of combat readiness of the Armed Forces required, but the entire country must be especially prepared for war against the aggressor.⁷⁷

⁷⁷ Marshal of the Soviet Union V. D. Sokolovskiy, Voennaya Strategiya, first edition (Moscow: Voenizdat, 1962), p. 232.

According to Sokolovskiy, the threat posed to the armed forces and the survival of the country as a whole "has given rise to the appearance of a new strategic safeguard of the vital functioning of countries, known as civil defense."⁷⁸

In his turn, Grechko pointed out that "a state's economy as the material base for war is increasingly becoming the target of armed attack."⁷⁹ Yet, as Soviet military writers insist, the preservation of the economy, transportation and other essential services is critical for the successful waging of war. Consequently, Grechko notes that:

Modern war requires the creation of a reliable defense of not only individual installations, as was the case in the past, but also a carefully thought-out and organized system of measures to ensure stability of the operation of the entire national economy and reliable protection of the populace throughout the country.⁸⁰

A reliably operating home country, he insists, is essential for effective war fighting. "If one does not opportunely carry out measures to increase the stability of operations of the national economy and to protect the population," Grechko writes, "the losses, damage and disruption resulting from enemy nuclear strikes will make such support of the war effort impossible."⁸¹

Thus, it is not general losses and damage resulting from nuclear strikes which are the subject of primary Soviet concern, but those losses and damage which will endanger the success of Soviet war fighting and the attainment of Soviet war aims.

⁷⁸Ibid., p. 395.

⁷⁹Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 114.

⁸⁰Ibid., p. 115.

⁸¹Ibid., p. 114.

4. The Increased Emphasis on Civil Defense After SALT I

Changes in the perceived threat posed by improved U.S. strategic capabilities have not altered Soviet views on the role and utility of civil defense. On the contrary, they have resulted in an increased interest in civil defense, even while seeking ways to deal with new U.S. strike capabilities. In discussing the history of the development of Soviet civil defense and the problem of its ability to fulfill its mission--leadership and population protection, economic continuity and superior post-attack recovery--its chief, Army General Altunin wrote:

If we analyze the history of USSR Civil Defense, we can trace several basic trends which have defined its development and improvement. In the first place, the gradual transition from scattered measures to protect the civilian population and facilities of importance to the economy, which were extremely limited both geographically and in scope, and therefore of a highly local nature, to a unified system of measures of nationwide significance. Second, the necessity of comprehensive execution of tasks pertaining to protecting the population and increasing the operating stability of the nation's economy. Third, tireless search for the most effective ways of improving methods of solving the problems of civil defense in connection with the development and perfection of the potential adversary's offensive weaponry. Fourth, the necessity of more closely coordinating civil defense tasks with the performance of the general tasks of the economy. Fifth, a constant broadening, improvement and strengthening of the technical base of civil defense. Finally, we should particularly emphasize the steadily increasing importance of close coordination between the Armed Forces and the USSR Civil Defense.⁸²

The establishment of a national civil defense system and program under the control and direction of the Ministry of Defense in 1961 reflected the recognition that civil defense could play a vital role in national survival and the attainment of "victory." This view persisted throughout the 1960s, despite Soviet progress towards attaining strategic parity with the United States, improved prospects for an effective Soviet counterforce capability and the

⁸²Altunin, Voenno-Istoricheskiy Zhurnal, No. 11, November 1976, p. 47.

beginnings of detente in U.S.-Soviet relations.⁸³ Even so, the 1972 arms control agreements and the formal adherence of the U.S. to the principles of "peaceful coexistence" raised new issues about the future of the Soviet defense programs in general, including that of civil defense.

The fundamental Soviet conclusion at that time was that the Soviet Union should continue its military build-up within the framework of SALT I. This was justified on the ground that the "aggressive essence" of imperialism remained unchanged and that the threat of war, while reduced, was not and would not be eliminated until the final and complete defeat of capitalism worldwide.⁸⁴ The Soviet defense policy, as expressed by the leaders, was "the more the better."

The signing of the ABM Agreement at the 1972 Moscow Summit, however, gave rise to the belief among various people in the U.S. that the Soviet Union was subscribing to the "mutual assured destruction" concept. Whatever Soviet motivations were for signing the agreement, this was not one of them. The ABM Agreement, as Soviet actions have shown, has not lessened Soviet interest in improving its active and passive defense systems and in strengthening Soviet capabilities to survive a nuclear war.

Specifically, rather than diminish the significance of civil defense, it was upgraded following the 1972 Moscow Summit, both in terms of status and in terms of efforts devoted to it. In the Fall of 1972 the aging chief of USSR Civil Defense Marshal Chuikov was replaced by a younger officer, the 51 year old Colonel General Altunin. Subsequently, Altunin was appointed a Deputy Minister of Defense, promoted to the rank of Army General and made a full member of the CPSU's Central Committee. Thus, USSR Civil Defense was raised to the level of a service of the Soviet Armed Forces.⁸⁵

⁸³ For example, see Lieutenant General D. I. Shuvyrin, "A Reliable and Effective System," Voennye Znaniya, No. 10, October 1968, p. 17; Chuikov, Grazhdanskaya Oborona v Raketno-Yadernoi Voine, p. 12; Lieutenant General Malinin in Sovetskaya Rossiya (Soviet Russia), June 5, 1968.

⁸⁴ See Goure et al., The Role of Nuclear Forces in Current Soviet Strategy, pp. 74-100.

⁸⁵ See Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, pp. 102-106; "USSR Armed Forces," Sovetskaya Voennaya Entsiklopediya, Vol. 2, (Moscow: Voenizdat, 1976), p. 353.

Soviet spokesmen, including the Minister of Defense Grechko, also began more uniformly to speak of civil defense as a "strategic factor." It was asserted that "the Communist Party and the Soviet government attach great importance to civil defense and show constant concern for strengthening it."⁸⁶

The upgrading of the status of USSR Civil Defense has been accompanied by increased efforts to improve its capabilities and readiness. Extensive "reorganization and improvement of all segments of civil defense" and development of new forms of training the population was announced in 1973. Along with this the new program called for accelerated blast shelter construction "so as to provide shelters for the entire population" in potential target cities as the primary method for protecting the population. Preattack urban evacuation remains as an option, but the new program provided for a marked speed-up in its rate. Exercises became larger in size, more comprehensive and realistic. A network of specially-equipped training facilities was built throughout the USSR. It also appears that the party organizations and soviets at various levels have begun to take a more active part in supervising the implementation of the civil defense program.⁸⁷

Again, the negotiations of the SALT II agreement have not altered Soviet efforts in civil defense. The Soviet Union obviously refused to negotiate any reduction in these efforts. Instead, Brezhnev and others made clear that the Soviet civil defense program will be continued. Civil defense, Soviet spokesmen persist in asserting, is "an objective necessity" and consequently the Soviet Union "will continue to solve this task persistently and stubbornly, no matter what imperialist propaganda says about it."⁸⁸

⁸⁶ M. N. Titov et al, Grazhdanskaya Oborona (Civil Defense) (Moscow: Vysshaya Shkola, 1974), p. 5. See also Egorov et al., Grazhdanskaya Oborona, p. 3.

⁸⁷ For the post-1972 Soviet civil defense program see L. Goure, War Survival in Soviet Strategy: USSR Civil Defense, passim, and Shelters in Soviet War Survival Strategy (Washington, D.C.: Advanced International Studies Institute, 1978), pp. 2-4.

⁸⁸ Altunin, Krasnaya Zvezda, February 3, 1978, and Voennye Znaniya, No. 10, October 1978, p. 18; "An Important Matter for All the People," Krasnaya Zvezda, March 12, 1980.

C. CIVIL DEFENSE AND SOVIET VIEWS ON WAR INITIATION

In planning for war survival, the Soviets must take into account the probable form of war initiation, the time factor available for implementing civil defense measures and the likely targeting doctrine and strategies of their potential enemies. Obviously, the longer the strategic warning of a possible enemy attack is, the better will be readiness of the armed forces and civil defense to carry out their assigned missions and essential measures. The time required for such readiness can be reduced by preparatory measures carried out in peacetime, but it is not possible to maintain at all times the fullest capability for war fighting and war survival, although the trend is to maintain as high a level of readiness in peacetime as possible.

1. The Soviet War Initiation Scenario

Soviet military doctrine assumes the possibility of occurrence of wars fought on various scales and with different uses of weapons.

a. At one end of the possible spectrum are conventional limited wars. Such wars may remain limited to the use of conventional weapons because both sides would fear its escalation into an uncontrolled nuclear war.⁸⁹

b. Limited wars may also escalate into limited nuclear wars, with or without further escalation into an all-out nuclear war. The general Soviet line, however, is that "big wars may sneak up gradually, beginning with 'local conflicts,'"⁹⁰ and that resort to nuclear weapons in a limited war increases the probability that it will escalate into an all-out nuclear war.⁹¹

c. All-out nuclear war, which as was noted, is generally assumed in Soviet doctrine to be characteristic of a war between opposing systems.

⁸⁹ Army General S. Ivanov, "Soviet Military Doctrine and Strategy," Voennaya Mysl', No. 5, May 1969, FPD Translation No. 0116/69, December 18, 1969, p. 49; Egorov et al., Grazhdanskaya Oborona, p. 8.

⁹⁰ V. Matveyev, "Gambling on Conflicts," Izvestiya, August 31, 1978.

⁹¹ For example, Colonel T. Kondratov, "The Reactionary Essence of the Theory of 'Limited Wars,'" Krasnaya Zvezda, September 28, 1972; L. S. Semeyko, "New Forms But the Same Essence as Hitherto," Krasnaya Zvezda, April 8, 1975; and in "The Pentagon's Nuclear Strategy," New Times, No. 35, August 1977.

Soviet discussions of the initiation of a war between the two opposing systems assume two possible forms: a progressive escalation of a limited conventional/nuclear war or an all-out nuclear surprise attack. The scenario which concerns the Soviets the most and for which they claim they need to be prepared is the worst case because "modern war can begin with a surprise attack by the enemy with the massive use of nuclear missile weapons."⁹² There are two reasons given for this. First, modern weapons are especially well suited for a decisive surprise attack. Second, a successful first strike can determine the outcome of the war and even result in the enemy's collapse. According to Soviet doctrine, therefore, a surprise first strike represents the optimal strategy for waging a nuclear war.⁹³

The Soviets argue, therefore, that they cannot discount the possibility that the enemy, i.e., the U.S., will adopt a first strike strategy and launch such an attack by surprise. For example, the Chief of the General Staff of the National Air Defense Forces (PVO Strany) has asserted that:

The experience of history testifies that imperialist aggressors, unleashing wars and pursuing their adventurist aims, fundamentally count on surprise and consider it one of the factors for achieving victory. By surprise attacks, they count, first of all, on sharply changing the correlation of forces in their favor, seizing the initiative, weakening and disorganizing the capacity of the opposing side for defense. It would be a mistake to ignore and underestimate this circumstance. Without question, the role of surprise in contemporary war has grown: a surprise attack with the use of nuclear weapons, to a greater degree

⁹²Krutskikh, Uchebno-Metodicheskoe Posobie, p. 13. See Egorov et al., Grazhdanskaya Oborona, p. 8.

⁹³For example, see Goure et al., The Role of Nuclear Forces in Current Soviet Strategy, pp. 102-110.

than ever before, can influence the course and outcome of the war, battles, operations, and the armed struggle as a whole.⁹⁴

The possibility of the U.S. adopting a first strike strategy, in particular a counterforce strategy, is considered by the Soviets to be a realistic possibility. First, given the potential decisive character of a first strike, whether "preemptive" or not, makes the choice of such a strategy logical from the military standpoint. Second, the increased accuracy of new weapon systems and their high state of readiness makes a first counterforce strike and thus a surprise nuclear attack increasingly feasible and likely to succeed.⁹⁵

Of course, this logic applies equally to the Soviet Union. It is said that "surprise is one of the important principles of military art" and, according to the Deputy Chief of the General Staff Academy, one of the "highly important principles" of Soviet strategy is "covert preparations for and conduct of surprise strikes."⁹⁶ Regardless of whether the all-important first Soviet counterforce strike is "preemptive," as the Soviets usually claim, or not, a critical requirement for its success will be the element of surprise.

Even while arguing that the Soviet Union must be prepared for an enemy surprise attack, Soviet discussions of this threat generally suggest that the Soviet Union will detect the enemy's

⁹⁴ Colonel General V. Sozinov, "The Time Factor in National Air Defense," Vestnik Protivovozdushnoi Oborony (Herald of the Anti-Air Defense), No. 10, October 1977, pp. 14-15. See also Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 92; Kulikov, "High Combat Readiness is the Most Important Condition of the Reliable Defense of the Motherland," Kommunist Vooruzhennykh Sil, No. 6, March 1973, p. 15; Zimin, Razvitie Protivovozdushnoi Oborony, p. 87.

⁹⁵ For example, see Major General R. Simonyan, "In Search of a 'New Strategy,'" Pravda, March 19, 1979; L. Semeyko, "The Pentagon's Secret Scheme," Krasnaya Zvezda, September 15, 1978.

⁹⁶ Major General M. M. Kir'yan, "Surprise," Sovetskaya Voennaya Entsiklopediya, Vol. 2 (Moscow: Voenizdat, 1976), p. 161. See also Colonel General F. Gaivoronskiy, "The Development of Soviet Operational Art," Voenno-Istoricheskiy Zhurnal, No. 2, February 1978, p. 26.

intention in time to launch a "preemptive" strike or at worst to launch on warning. These discussions do not specify what precise enemy actions would trigger a Soviet preemptive strike and the length of strategic warning the Soviets expect to have. The determination of the existence of a threat of attack is based as much on political as on military indicators and is first of all the responsibility of the political leadership. It is noted, therefore, that "a great deal depends on the ability and timeliness of the political leadership in discovering an aggressor's immediate preparation for an attack, determining his intentions, and making the decision to carry out a devastating retaliatory strike"⁹⁷ before the enemy is able to launch his strategic offensive forces. The error of misreading enemy intentions, as happened in the case of the German attack on the Soviet Union in 1941, will not be repeated.⁹⁸

The execution of a successful surprise attack requires concealment and deception. It is assumed that there will be various indicators of enemy intentions which, if correctly assessed, would provide strategic warning of an attack. Presumably, the political indicators will include a sharp worsening in U.S.-Soviet relations, the predominance in the U.S. political leadership of so-called "reactionary" elements, the whipping up of war hysteria among the population, a drive to achieve military superiority, threatening statements in U.S. public declarations and diplomatic communications, and so on. The danger will also grow if the U.S. is losing a limited war in an area vital to U.S. interests, or if there are signs of growing despair among Western leaders that the advance of communism cannot be halted short of war.

There are likely to also be military indicators and these presumably would be watched with special attention. Thus, according to Grechko:

Under conditions of a threat of aggression it is essential to watch especially carefully the military preparations of the enemy, to ascertain his intentions in time, and to take the necessary measures to rebuff the enemy attack; the slightest oversight in this gives the aggressor the

⁹⁷ Skirido, Narod, Armiya, Polkovodets, p. 122.

⁹⁸ L. I. Brezhnev, Fifty Years of Great Achievements of Socialism (Moscow: Progress Publishers, 1970), p. 63; Ogarkov, Sovetskaya Rossiya, February 23, 1977; Editorial, "Be On Alert," Voennye Znaniya, No. 6, June 1977, p. 1.

possibility of capturing the initiative, which it will be very difficult to recapture subsequently.⁹⁹

Among the military indicators will be the deployment and increased state of readiness of strategic forces. Other indicators, suggested in a 1968 article published in the General Staff journal Voennaya Mysl' (Military Thought), included: increased "protection" of military forces and important installations, "creation of highly mobile strategic nuclear means capable of changing the launch points in time after launches," intensified development, deployment, and readiness of anti-aircraft and anti-ballistic missile defenses, increased activity of reconnaissance and efforts to disrupt enemy reconnaissance and surveillance activities and capabilities.¹⁰⁰ Various additional enemy activities will be taken into account such as the call-up of reserves, the deployment of conventional forces, the stockpiling of supplies, and so on.

It is not clear at what point these indicators, which range from a broad spectrum of preparatory measures for greater war readiness to specific and immediate warnings of an imminent attack, will justify a decision to launch a preemptive strike short of warning of an actual launch of enemy strategic weapons. From the Soviet point of view, however, launch on warning, let alone launch under attack, would not be the preferred option. Under such conditions the effectiveness of the Soviet preemptive counterforce strikes would be greatly reduced, and the threat to the survival of the Soviet Union would correspondingly increase.

The Soviets note that modern means of reconnaissance, surveillance and early warning make it increasingly difficult to launch a successful surprise attack. For example, it is noted that:

The development of technological means of reconnaissance makes the attainment of surprise more difficult. The large-scale introduction of radio-electronics increases the capability for the timely detection of the enemy's preparations for launching a strike. With the aid of radio-electronic means it is feasible to ascertain with a high degree of reliability the moment of mass launch of missiles, the launching of aircraft, the approach of

⁹⁹ Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 92.

¹⁰⁰ Major General N. Vasedin and Colonel N. Kuznetsov, "Modern Warfare and Surprise Attack" Voennaya Mysl', No. 6, June 1968, FPD Translation No. 0051/69, January 16, 1969, p. 43.

naval forces, the forward movement of large groupings of troops and other actions.¹⁰¹

Consequently, preparations for a surprise attack require special efforts at deception and concealment, as well as "active measures to suppress and blind the enemy's reconnaissance forces and means by creating strong interference with radio-electronic systems and surveillance means."¹⁰²

Soviet spokesmen do not make clear why they believe that they will be able to detect enemy preparations for a surprise attack and yet will be capable of launching a successful preemptive counter-force strike of their own. It is asserted that given the existence of present means of surveillance and warning, this "demands the search for ways and means to conceal from the enemy the actual deployment of various means and systems which make possible resort to nuclear and other weapons."¹⁰³ While the Soviets do not speak of their work on an ASAT capability, they have mentioned, in addition to deception and concealment, the detonation at the beginning of military operations of high altitude, large yield nuclear weapons "to destroy the system of control and communications and suppress the anti-missile and anti-air defense radar system and the aircraft control system."¹⁰⁴ Aside from this, the main emphasis is on maintaining the Soviet armed forces, and especially the strategic forces, in a state of high combat readiness. Constant improvement in combat readiness is a continuous theme in Soviet pronouncements. Apparently a growing proportion of the Soviet ICBMs are being held on what amounts to a quick-reaction alert posture.¹⁰⁵

¹⁰¹Kir'yan, Sovetskaya Voennaya Entsiklopediya, Vol. 2, p. 163.

¹⁰²Ibid.; Vasedin and Kuznetsov, Voennaya Mysl', No. 6, June 1968, FPD Translation No. 0051/69, January 16, 1969; Colonel I. Andrushkevich, "Some Problems of Surprise in Warfare," Voennaya Mysl', No. 8, August 1971, FPD Translation No. 0011/74, February 28, 1974, pp. 103-104.

¹⁰³Kir'yan, Sovetskaya Voennaya Entsiklopediya, Vol. 2, p. 163. See also Vice Admiral P. Navoytsev, "Operational Camouflage and Deception in Naval Combat Operations," Voenno-Istoricheskiy Zhurnal, No. 2, February 1978, p. 49.

¹⁰⁴Vasedin and Kuznetsov, Voennaya Mysl', No. 6, June 1968, FPD Translation No. 0051/69, January 16, 1969, p. 44.

¹⁰⁵Secretary of Defense Harold Brown, Defense Department Annual Report for Fiscal Year 1980 (Washington, D.C., Department of Defense, January 25, 1979), p. 72.

In any event, Soviet perception of the initiation of a nuclear war between the two opposing systems allows for both long and short strategic warning. To a large extent, the timeliness of the warning depends on the foresight and acumen of the political leadership. Its ability to correctly assess the threat cannot be questioned by Soviet analysts although there is a historic precedent for its failure to do so. There is also the troublesome point that a skillful enemy may be able to conceal his preparations and deceive the Soviet Union as to his intentions, just as the latter seeks ways and means to achieve surprise. Finally, the growing number of strategic weapons and their increased state of readiness may make specific indicators of an impending attack more difficult to detect and therefore reduce the warning time.

Of course, if the Soviet Union were to decide on a plan for a first strike, it would have strategic warning of the enemy's retaliatory attack. But the problem of how to achieve surprise would still remain acute. Furthermore, the length of the strategic warning would depend on circumstances. For example, the Soviet Union may plan an unprovoked attack or its decision to strike may be an outgrowth of an ongoing limited war or of some other rapidly developing crisis. Thus, given the uncertainties, it is not surprising that the Soviets, while hoping for the best, argue that they must be prepared for the worst.

2. The Time Factor and Soviet Civil Defense Readiness

An ideal civil defense system should be capable of being effective with minimum warning, i.e., with no more time than may be provided by the early warning of an attack having been launched. The present Soviet civil defense program and capabilities fall well short of this ideal, although they may seek to approach it, given time and sufficient investments.

The present Soviet civil defense system is quite sensitive in many but not all of its elements to the time factor. This sensitivity is lowest with respect to the protection of elements of the population and of the economy which have been given the highest priority and attention. For example, there is a capability to protect the leadership element, key civil defense staffs, members of the elite and a portion of the essential work force in blast shelters with little warning of an attack. Presumably, plants already located in underground facilities also require little or no warning time. The sensitivity to the time factor is highest with respect to requirements for implementing measures to protect the general population and the major part of the economy.

According to Soviet civil defense plans, the time required to execute various critical civil defense measures and to bring

existing facilities to a full state of readiness varies, but is by no means short.¹⁰⁶ For example, the clearing of shelters used as storage facilities or for other purposes and making them ready for use may require 12 hours. Construction of additional hasty blast shelters may require up to 72 hours. How much time would be required to stock shelters with food is not indicated in Soviet publications, but it would certainly be time consuming. The evacuation of urban populations would require, according to Soviet plans, from 48 to 72 hours. More time will be needed to provide all evacuees with fallout shelters. Preparation of enterprises to convert to production under war conditions is said to require 48 to 72 hours and the hasty hardening of special machinery and equipment at least 24 hours. How much time would be required to relocate select enterprises is not indicated. Presumably this will depend on whether only the personnel is relocated to a reserve enterprise with pre-positioned machinery and equipment or whether some of the machinery and equipment will also be moved.

In principle, therefore, bringing civil defense to a state of full readiness and implementing all the measures prescribed in the plan to be put into effect under conditions of a "threat of attack" would require 48 to 72 hours or more. Of course, it is uncertain how much in advance of an attack the government would announce that a "threat of attack" exists, or for that matter, whether it would announce it at all. As a practical matter, especially in a period of a worsening of the international situation and a slowly escalating crisis, the Soviet government can institute many of the required measures quite early without causing severe social or economic disruptions or appearing to be threatening. Indeed, many measures, such as shelter construction and stocking, conversion of industry to readiness for operation under war conditions, construction of rural shelters, stockpiling, and possibly even limited evacuation may be difficult for outside powers to detect or reliably confirm in a crisis period. In other words, the Soviet civil defense system is sensitive to early warning for its effectiveness, but this sensitivity will be especially significant primarily during rapidly escalating crises or the detection of U.S. intention to launch an imminent surprise attack. It is evident, however, that Soviet civil defense will be least effective if tied to a Soviet launch-on-warning strategy, which is another reason why the Soviets are likely to regard such a strategy as unsatisfactory.

¹⁰⁶For example, see Egorov et al., Grazhdanskaya Oborona, pp. 286, 289-291, and the 2nd edition, pp. 521-523.

3. The Problem of Civil Defense and the Requirements for a Successful Soviet First Counterforce Strike

There appears to be a contradiction between the time required to implement Soviet civil defense measures and the stated Soviet objective to deliver a "preemptive" first counterforce strike, preferably by surprise to enhance its success. Of course, as the Soviets themselves suggest, there are various indicators of a country's intention to initiate an attack which could be detected despite efforts to conceal them. Conceivably, the Soviets believe that their system will make it easier for them to practice successfully concealment and deception of their intentions, but this would be fraught with a great deal of uncertainty. The suggestion that preparations for a surprise attack require the disruption of enemy means of reconnaissance, surveillance and warning could constitute a form of warning to the other side, unless such actions are taken and sustained for a considerable period prior to the initiation of the attack, thus misleading the enemy about their significance.

One aspect of civil defense which requires the longest lead time for its implementation and at the same time may warn the enemy of preparations for a surprise attack could be the large-scale evacuation of Soviet cities. The scale of such an operation would make it difficult and most likely impossible to conceal, while, as noted, its implementation would require at least 48 hours and probably more time. Given the importance for Soviet war survival of a successful first counterforce strike, the desirable method for protection of the population should be sheltering in-place rather than pre-attack evacuation.

There are indications that the Soviet planners are aware of this problem. They are also sensitive to the possibility that there may be little strategic warning of an attack and that a conflict may escalate very rapidly, thus leaving insufficient time to implement the more time-consuming civil defense measures. It is argued, therefore, that USSR Civil Defense must be prepared to be effective in a worst-case situation, i.e., the threat of an attempted enemy surprise attack. For example, a 1977 Soviet civil defense manual states:

A war with the use of nuclear weapons may begin with a surprise nuclear strike. Civil Defense should prepare particularly carefully, actively and purposefully for precisely such a version of the initiation of aggression against the Soviet state, since this version is the most

dangerous and fraught with the threat of great casualties among the peaceful population.¹⁰⁷

Pre-attack evacuation of urban populations as the primary method for their protection was introduced in the late 1950s. One reason given was the high cost of shelters, which, it was said, made it impractical to provide the entire urban population with protection in blast shelters. However, shelter construction begun in the 1950s continued, but ready shelter capacities were considered insufficient to obviate the need for reliance on evacuation. Thus, according to Altunin:

It was impossible in a short period of time to provide the urban population with reliable shelters which would offer protection against all the casualty-producing effects of nuclear weapons. Therefore, initially as a primary measure the evacuation and dispersal of people from the most highly-threatened zones was envisaged. At the same time, measures were taken to build special protective structures /i.e., shelters/.¹⁰⁸

By the 1970s there was a change in the order of priority of methods for the protection of the population of potential target cities. Altunin announced a requirement to "provide the entire population of cities and installations which are the most likely targets for nuclear strikes with shelters."¹⁰⁹ Altunin acknowledged that "this is undoubtedly a very difficult task, but it can be accomplished,"¹¹⁰

¹⁰⁷ Egorov et al., Grazhdanskaya Oborona, third edition, p. 8. See also K. G. Kotlukov, K. S. Oglobin and A. I. Sgilevskiy, Grazhdanskaya Oborona Vchera i Segodnya (Civil Defense Yesterday and Today), second edition (Moscow: Atomizdat, 1975), Translation on USSR Military Affairs, GUO 32/76, July 8, 1976, p. 19; Krutskikh, Uchebno-Metodicheskoe Posobie, pp. 13-14.

¹⁰⁸ Altunin, Voенно-Istoricheskiy Zhurnal, No. 11, November 1978, p. 45. Emphasis added.

¹⁰⁹ Altunin, Lyudi i Dela Grazhdanskoi Oborony, p. 8. See also Altunin, Sovetskii Patriot, November 21, 1973, "An Important Aspect of Training," Uchitel'skaya Gazeta (Teacher's Gazette), August 22, 1974.

¹¹⁰ Altunin, Lyudi i Dela Grazhdanskoi Oborony, p. 8.

presumably because a sufficient fund of shelters had already been built to make it possible to achieve this objective. The shift in emphasis was made quite explicit. For example, it was said that "a plan for sheltering the population in protective structures has been brought to the fore as the most reliable one for saving the lives of people from nuclear armed missiles."¹¹¹

The justifications offered by Soviet spokesmen for the shift in emphasis to sheltering in-place were based on the belief that there may be insufficient warning time prior to an attack to implement or complete urban evacuation. For example, Altunin, while calling for shelters for the "entire population" in potential target cities, argued that the new "task of Civil Defense is to raise to the maximum the reliability of the protection of the population from the first hour of a war under any condition of its initiation."¹¹² He went on to assert that this would deny the enemy the success he hopes to achieve from a surprise attack. In a similar vein, a Soviet publication stated:

The basic methods for protection of the population are to shelter it in protective structures, and also to evacuate and disperse the population. Here it must be recalled that in the not too distant past the chief method for protection of the population was considered to be evacuation and dispersal. Now, when there has been further development and improvement of nuclear missiles and strategic aviation, in case a war breaks out, the aggressor may make an attempt to deliver an anticipatory nuclear missile strike.... Under these conditions, the time period for performing protective civil defense measures may be extremely limited, especially those for carrying out dispersal and evacuation.... It stands to reason that the reliability of protection is attained if there is a sufficient number of covers and reliable shelters right in places where people work (live), or nearby.¹¹³

¹¹¹ Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, p. 20.

¹¹² Altunin, Lyudi i Dela Grazhdanskoi Oborony, p. 8.

¹¹³ Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, pp. 19-20. See also Krutskikh, Uchebno-Metodicheskoe Posobie, p. 14.

The shift in emphasis to shelters is reflected not only in civil defense publications, especially after 1973, but also in statements by national and local Soviet civil defense officials.¹¹⁴ This does not mean, however, that pre-attack evacuation and dispersal have been dropped as a method for protecting the population. Evacuation remains as one of the options in the Soviet civil defense program and mention is made of a combination of sheltering in-place and evacuation as being most effective for protection of the population.¹¹⁵ Even then, it was announced in 1973 that the rate of evacuation would be speeded up by requiring a portion of the urban population to leave the city on foot in organized columns rather than wait for transportation.¹¹⁶ The point made is that if circumstances do permit the evacuation of the urban population, it must be carried out in an "extremely compressed time period." The accelerated rate of evacuation will undoubtedly reduce the time needed for its completion, but it will still require days to carry out. Of course, as more shelters become available the number of urban residents who will have to be evacuated for their protection will decline.

The new priority assigned to sheltering in-place as the primary method for protection of the population is an important and potentially ominous development. If and when the Soviet Union has sufficient shelters to protect all or the majority of residents in cities and at installations which are believed to be targeted by U.S. strategic forces, the Soviet authorities will have the option to forego the pre-attack evacuation as an essential civil defense measure in favor of increasing the chances of success of a Soviet surprise first strike.

4. Soviet Targeting Doctrine and Views on U.S. Targeting Concepts

As a matter of general principle, the Soviets hold that "politics," i.e., the class character of belligerents and the war aims they pursue, "determine the priority and strength of the blows inflicted on the

¹¹⁴See Goure, Shelters in Soviet War Survival Strategy, p. 4; The Soviet Civil Defense Shelter Program (Washington, D.C.: Advanced International Studies Institute, 1977), pp. 6-7.

¹¹⁵Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, p. 20.

¹¹⁶Altunin, Voennye Znaniya, No. 12, December 1973, p. 5.

enemy."¹¹⁷ Deliberate restraint in the choice of targets and the magnitude of the strikes upon them are possible for reasons of "political motives."¹¹⁸ It is asserted that:

At present political conditions will be considered when selecting regions for delivering nuclear strikes on a countrywide scale, when determining the number of objectives /i.e., targets/, the degree of their destruction, the priority of inflicting strikes, and the methods of destruction of industrial, administrative-political and other centers.¹¹⁹

According to Soviet doctrine, a war between opposing systems is assumed to be waged to achieve "decisive" aims which include not only the military but also political defeat of the enemy. Consequently, the Soviet Union is likely to seek not merely the defeat of the enemy but his "destruction," the inflicting of "crushing" blows which would result in the collapse not only of his war-making capability but also of his political system. Furthermore, it is suggested that "only the maximum concentration of forces in the first strike (or strikes) can crush the enemy" and presumably achieve "decisive results."¹²⁰ The objective of achieving such results, however, does not mean inflicting maximum destruction for its own sake. The Soviets never speak of bombing the U.S. "into the stone age," or preventing any recovery. At the same time there is no indication that the Soviets are giving any serious thought to a negotiated war termination and would avoid attempting to destroy the enemy's government for that reason.

¹¹⁷ Volkogonov et al., Voina i Armiya, p. 153. See also Lieutenant General G. Semenov and Major General V. Prokhorov, "Scientific-Technical Progress and Some Questions of Strategy," Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0060/69, June 18, 1969, p. 23; Colonel M. Shirokov, "The Question of Influences on the Military and Economic Potential of Warring States," Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 39.

¹¹⁸ Shirokov, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 39.

¹¹⁹ Ibid.

¹²⁰ Marshal of the Soviet Union M. Zakharov, "Soviet Military Science Over Fifty Years," Voennaya Mysl', No. 2, February 1968, FPD Translation No. 0042/69, April 25, 1969, p. 51. See also Krutskikh, Uchebno-Metodicheskoe Posobie, p. 7.

The stated Soviet objective being military and political "victory" over the enemy, Soviet strategic targeting doctrine is intended to accomplish this objective in the most effective and expeditious manner with the forces and means at its disposal. The Soviet targeting strategy, however, is first of all an element of and determined by the overall Soviet war-fighting strategy. Consequently, it will "select from among the objectives /i.e., targets/ those which have the greatest influence on the course and outcome of the armed struggle."¹²¹

In terms of order of priority, therefore, the most urgent targets for attack are the enemy's strategic forces and their C³I, military bases and large troop formations. Next in importance are the enemy's defense industries and other economic support systems needed to sustain his war effort and replace losses and his political control. Finally, there are the other elements of the economy which have the potential for preserving and reconstituting the enemy's power. As the Soviets put it: "In a missile nuclear war, of greatest significance will be the destruction of means of retaliation, the undermining of the military-economic potential of the state and the depressing of the morale of its population."¹²² The population, as such, is not specifically targeted, but, as Soviet spokesmen point out, the strikes will destroy cities, and unless it is protected, the population will suffer "enormous" losses.¹²³ Put another way, in planning strategic offensive strikes:

First and foremost a rational distribution of nuclear weapons is required against the so-called active and passive enemy targets. Active targets are primarily nuclear means and the most important means which ensure the effective application of nuclear weapons. Passive targets include the military-economic and administrative-political centers, and also other targets which are not

¹²¹Shirokov, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 33.

¹²²Zimin, Razvitie Protivovozdushnoi Oborony, p. 87. See also Lieutenant General A. I. Odintsov, Uchebnoe Posobie po Nachal'noi Voennoi Podgotovke, (Training Manual for Initial Military Training) (Moscow: Voenizdat, 1975), pp. 49-50.

¹²³Egorov et al., Grazhdanskaya Oborona, p. 10; Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 114.

directly involved in the application of nuclear weapons.¹²⁴

The importance of counterforce targets is a persistent theme in Soviet military writings. Included in the list of such targets are enemy land-based missiles, bombers at their bases, submarine and naval vessels in port, nuclear weapons storage sites, enemy reconnaissance means, and so on. It is said that:

It would appear to be evident that in order to obtain a favorable correlation of forces to one's own advantage maximum effect must be directed against the nuclear means of the enemy.¹²⁵

Some Soviet military writers argue that strikes on the enemy's strategic forces will result "in the disruption of the entire military potential of the enemy, and not only his subsequent employment of strategic weapons."¹²⁶

It is recognized that counterforce strikes may face the problem of launch on warning or under attack by the enemy, and that in any case strategic forces are held in a state of high readiness for launch. It is suggested, therefore, that the enemy's command, control and communications systems should be a primary target for the initial strike.

The development of modern carriers of nuclear weapons, especially ballistic missiles, has led to a sharp improvement in the combat readiness of primarily the strategic nuclear forces, as a consequence of which the struggle against them at the time of launching becomes even more difficult.

Under these conditions the important enemy targets during the accomplishment of the task for changing the

¹²⁴Major General I. Anureyev, "Determining the Correlation of Forces in Terms of Nuclear Weapons," *Voennaya Mysl'*, No. 6, June 1967, FPD Translation No. 0112/68, July 11, 1968, p. 38.

¹²⁵Ibid.

¹²⁶Colonel L. Semeyko, "Methodology of Determining the Correlation of Nuclear Forces," *Voennaya Mysl'*, No. 8, August 1968, FPD No. 0019/70, March 30, 1970, p. 55.

correlation of forces in one's own favor become the various supporting systems and primarily the control system.¹²⁷

The targeting of the enemy's "military-economic potential" includes not only his military forces but what is called the "sources of his military power," i.e., the essential "means and resources" which sustain his military capability and operations. The objective is not to destroy the enemy's economy per se, nor do the Soviets indicate that their aim is to destroy a specific percentage of the enemy's recovery capability. Instead, it is said that the Soviet Union will target the "economic foundations for war of the imperialist coalition" and will do so in a manner calculated to have the best direct effect on the enemy's capabilities to wage war. It is said, therefore, that:

The most important task is to correctly determine economic objectives and targets and vulnerable points, and to deliver strikes to those targets where they will lead to disorganization of the enemy economy. The objective is not to turn the large economic and industrial regions into a heap of ruins (although great destruction, apparently, is unavoidable), but to deliver strikes which will destroy strategic combat means, paralyze enemy military production, make it incapable of satisfying the priority needs of the front and rear areas and sharply reduce the enemy capability to conduct strikes.¹²⁸

The Soviet military writers assert that one of the "laws" determining the course and outcome of war is the "dependence of war on the correlation of the economic forces of the warring states (or coalitions)."¹²⁹ Consequently, the trend in modern warfare has been and will continue to be to target the opponent's economy whose

¹²⁷ Anureyev, Voennaya Mysl', No. 6, June 1967, FPD Translation No. 0112/68, July 11, 1968.

¹²⁸ Colonel M. Shirokov, "Military Geography at the Present Stage" Voennaya Mysl', No. 11, November 1966, FPD Translation No. 0730/67, July 27, 1967, p. 59.

¹²⁹ Volkogonov et al., Voina i Armiya, p. 155; Colonel N. Kulikov, "Laws of War: Essence, Peculiarities" Soviet Military Review, No. 11, November 1978, p. 3.

significance as a strategic factor persistently increases.¹³⁰ Soviet spokesmen assert that "in modern conditions the existence of missile-nuclear weapons has significantly increased and made more complicated the dependence of victory and defeat on the correlation of economic capabilities."¹³¹ In the Soviet view, major damage or destruction of key elements of the enemy's economy, and especially the logistic base of his armed forces, can preclude him from attaining his war aims and may result in his defeat.

Soviet spokesmen are seldom very specific in detailing the how and/or on what basis the enemy's economic targets for Soviet strikes will be selected. However, one such discussion is of interest:

In selecting any specific region as the target and determining the sequence of nuclear strikes against it, it is first and foremost necessary to determine the effect the strikes will have at a given time, the influence of the target on the progress of armed combat and on the functioning of the entire life of the country. It is also important to determine the quantity of forces and means required for destruction of the target and the capabilities of the enemy to rebuild. For this purpose, it is important to study the relative importance of specific regions (objectives) for the industrial production of the country, especially the output of production required in the manufacture of missiles and nuclear weapons and other modern combat materiel; the role of the region in the political life of the country; the degree to which the given industrial complex is tied in with other branches of industry; the relative importance of the region as a population center of the country, and especially as a source of qualified and scientific-technical personnel; the vulnerability of the region and the extent to which its industrial output can be produced by other industrial centers. In the selection of regions (objectives) for nuclear attacks, the industrial branch principle of exerting

¹³⁰ Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 114.

¹³¹ Volkogonov et al., Voina i Armiya, p. 155.

influence on the economic potential of a country will also be given consideration.¹³²

It is also pointed out that the effectiveness of the defense effort is highly sensitive to the destruction of transportation, plants producing electronic equipment, large power stations, oil refineries, synthetic fuel and chemical plants, blast furnaces, coking ovens, converters, and high-grade steel and non-ferrous metals producing plants.¹³³

The targeting of the administrative-political centers is seen first of all as contributing to the depression of the morale and will to fight of the enemy's population. Some Soviet writers suggest that the strikes will result in a revolution because the people will no longer tolerate a political system which has led them into a disastrous war and caused them such large losses. Of course, in addition, the destruction or disruption of the political-administrative control system will further contribute to the weakening of the economy and of the logistic support for the armed forces.

It would appear that the Soviets expect the U.S. to follow a targeting doctrine which generally parallels that of the Soviet Union. Soviet discussions of strategic targeting and of the character of a possible all-out nuclear war between the two opposing systems do not point to a distinctive American targeting doctrine. Instead, most discussions are in terms of what could be expected to be the targeting doctrine of either side, in the context of their war aims. In part, this Soviet view appears to stem from the belief that the Soviet targeting doctrine is both logical and rational, and best suited for the nuclear age and the character of a possible all-out nuclear war. Another reason for this view is the belief that the U.S. would pursue war aims similar to those of the Soviet Union, and that the U.S. would want to wage the war "seriously." The war aims, therefore, will dictate the U.S. targeting doctrine and this in turn would mean that the U.S. doctrine would be generally similar to that of the Soviet Union, or in other words, best suited for attaining U.S. war aims.

¹³²Shirokov, *Voennaya Mysl'*, No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 36. See also Cherednichenko, "Modern War and Economics," p. 22; Sukhoguzov, "Problems of Viability of the Economy in Modern War," pp. 10-15.

¹³³Shirokov, *Voyennaya Mysl'*, No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 36; Volkogonov et al., Voina i Armiya, p. 190.

This is not to say that the Soviets are unaware of the emphasis in U.S. targeting doctrine on the destruction of non-military targets or of the role "assured destruction" plays in U.S. deterrence strategy. No doubt the Soviets are aware of the U.S. retaliatory targeting strategy aimed at destroying a high percentage of Soviet recovery capability. Whether they have taken these deterrence threats entirely at face value is uncertain. True, the period when neither side had a reliable second strike capability, a retaliatory targeting strategy called primarily for targeting non-military value targets, given that a retaliatory counterforce strategy against enemy strategic nuclear forces would have little value. The situation changed, however, with the acquisition on both sides of an assured second strike capability and, as a consequence, also with the possibility of keeping a portion of their respective strategic forces in reserve. For example, in 1967 an article in Voennaya Mysl' (Military Thought) observed that:

With the existing level of development of nuclear missile weapons and their reliable cover below ground and under water, it is practically impossible to destroy them completely and consequently it is also impossible to prevent an annihilating retaliatory attack.¹³⁴

While the Soviet Union is intent on improving its counterforce capabilities and hopes to significantly weaken U.S. retaliatory strikes, there is no indication that the Soviets expect to be able to completely disarm U.S. strategic forces or prevent large numbers of U.S. nuclear warheads from being detonated on Soviet territory.

From the Soviet point of view, however, punitive retaliation is not the same as rational war fighting. In the light of Soviet logic the U.S. can be expected to adopt a first strike counterforce strategy which the Soviets appear to believe is a rational strategy when a country is faced by an enemy possessing nuclear weapons. Consequently, the Soviets persistently warn that the U.S. plans a first strike, that it may launch a surprise attack, and that it will devote a portion of its strategic forces to counterforce strikes. Indeed, according to public Soviet statements, the U.S. is seen as increasingly moving in the direction of adopting a counterforce strategy. In support of this claim, Soviet spokesmen point to U.S. concepts of limited nuclear war, to the improvements

¹³⁴ Ivanov, Voennaya Mysl', No. 5, May 1967, FPD Translation No. 0116/69, December 15, 1969, p. 49.

in the accuracy of U.S. strategic weapons and to the U.S. search for new strategic concepts.¹³⁵

The probability that the U.S. will execute a counterforce strategy in the event of a war does not reduce in the Soviet view the likelihood of massive strikes against Soviet administrative-political and economic targets and "entire economic regions." "Inflicting economic losses on the enemy," Soviet analysts write, "has become one of the basic missions of military operations."¹³⁶

At least publicly the Soviets reject the concept of a limited nuclear war targeted solely against military installations. While the possibility of a limited nuclear exchange has been acknowledged to be "theoretically" possible,¹³⁷ the concept of waging war according to some agreed "rules of the game" is generally said to be "illusory."¹³⁸ Presumably such a war would not bring "victory" or achieve "decisive" results and therefore would probably escalate. The Soviets have also claimed that American suggestions of a limited nuclear strategy were intended to place the Soviet Union in a position where it "would be deprived of the possibility of delivering a crushing retaliatory strike against U.S. territory or at least

¹³⁵ Major General R. Simonyan, "'Realistic Deterrence' - the Real Implications," New Times, No. 10, March 1976, pp. 18-20, and "In Search of a 'New Strategy,'" Pravda, March 19, 1979; Colonel L. Semeyko, "Imperialism's Strategic Concepts: The Course Toward Military Superiority," Krasnaya Zvezda, March 24, 1979; V. Boikov, "Conversations With a Reader," Novoe Vremya (New Times), No. 29, July 1979, p. 31; M. A. Mil'shtein, "At a Dangerous Cross Road," SShA: Ekonomika, Politika, Ideologiya, No. 10, October 1978, pp. 3-13, and "How Much is Enough?" Literaturnaya Gazeta (Literary Gazette), May 16, 1979, p. 14.

¹³⁶ Colonel Yu. Vlas'evich, "War and the Economy," Voenno-Istoricheskiy Zhurnal, No. 6, June 1978, p. 6.

¹³⁷ Ivanov, Voennaya Mysl', No. 5, May 1967, FPD Translation No. 0116/69, December 15, 1969, p. 49.

¹³⁸ G. A. Arbatov, "Strength-Policy Impasse," Soviet Military Review, No. 1, January 1975, p. 48; Major General R. Simonyan, "The Concept of 'Selective Targeting,'" Krasnaya Zvezda, September 28, 1976; Army General I. Shavron, "That 'Threat To The West,'" New Times, No. 10, February 1977.

weaken the strength of this strike as much as possible."¹³⁹

Although the Soviets cite U.S. statements to the effect that the U.S. intends to destroy at least 200 of the largest Soviet cities and kill from one-fifth to one-quarter of the Soviet population, there is in fact no indication that the Soviets expect the U.S. to target the population as such. Presumably, the U.S. would also select targets which would have the greatest effect on weakening the Soviet war-making capabilities and on the course and outcome of the war in general. Indiscriminate killing of the population would therefore be wasteful of weapons and presumably would not yield desired returns.

Indeed, the priorities of the Soviet civil defense program strongly suggest that the Soviets apparently believe that they are able to predict the most likely targets of U.S. strikes. For example, it is said that the Soviet shelter program is "carried out in a differentiated fashion, depending on the importance and location of the cities, regions, populated places, or installations of the national economy."¹⁴⁰ In the same vein, it is said that "shelters are constructed primarily in cities against which the use of weapons of mass destruction is most probable."¹⁴¹ More specifically, in Soviet discussions of what needs to be protected in the Soviet Union the types of targets appear to be essentially the same as those which the Soviets indicate they would target in the U.S. in an all-out strategic attack.¹⁴² These include political and military C³, defense industries, energy and power systems, transportation, communications, stockpiles and reserves, and so on.

Of course, while the categories of priority targets to be attacked would be expected by the Soviets to be the same for both the U.S. and USSR, the specific target selections may differ to some extent. Presumably, this would be due to the organizational, economic and military differences between the two countries, to different distribution of strategic targets on their respective territories and to differences in the intelligence on those targets.

¹³⁹ Major General R. Simonyan, "Wars As Seen by the Pentagon," Krasnaya Zvezda, May 27, 1976. See also A. Arbatov and G. A. Arbatov, "Schlesinger's Ideas in Form and Content," Novoe Vremya, No. 31, July 25, 1975.

¹⁴⁰ Krutskikh, Uchebno-Metodicheskoe Posobie, p. 10.

¹⁴¹ Ibid., p. 19.

¹⁴² Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, pp. 11-12.

Furthermore, in carrying out their civil defense program the Soviets can, to some extent, ignore U.S. targeting doctrine. The Soviets establish priorities in their civil defense program first of all in terms of what they believe is essential to protect for national-system survival and effective logistic support of their war effort. Given the sensitivity of such targets, their viability must be improved, if not reliably assured, regardless of the specifics of U.S. target selection. Once this is done, civil defense protective measures can be extended to other potential targets selected on the basis of a combination of their value to the Soviet Union and the likelihood that the U.S. would strike them. Finally, the program allows for lower cost measures, as for example the universal compulsory training of the population, which can be applied to the entire territory of the USSR and which, it is hoped, will contribute to the reduction of losses.

D. THE CONTRIBUTION OF CIVIL DEFENSE TO WAR FIGHTING

In the Soviet view, once war has begun, all efforts and capabilities of the Soviet Union must be directed to achieving two interdependent objectives: national-system survival and "victory." Civil defense "jointly" with the armed forces is seen as contributing to both objectives. For example, it is said that:

... the primary forces of civil defense and the Armed Forces in a future war must be closely coordinated and directed to the execution on one mission: namely, the destruction of the aggressor were he to attempt to attack us, and the protection of the stability of the rear areas.¹⁴³

Again, according to Altunin, civil defense and the Soviet armed forces conduct "joint operations" which are intended to strengthen the country's defense capabilities.¹⁴⁴ Furthermore, civil defense forces are expected to "solve a number of important tasks" in support of the armed forces.¹⁴⁵

¹⁴³ Tolstikov, Voennaya Mysl', No. 1, January 1964, FDD Translation No. 939, August 4, 1965, p. 35.

¹⁴⁴ Altunin, Sovetskaya Voennaya Entsiklopediya, Vol. 3, p. 24.

¹⁴⁵ Ibid.

1. The Contribution of Civil Defense to Soviet Military Capabilities and Operations

Soviet discussions generally are not very specific about the "tasks" which civil defense is expected to "solve" on behalf of the armed forces. Even so, certain elements of these tasks are indicated in the various discussions of this topic. It should be noted, however, that Soviet expectations of the ability of civil defense to contribute to the military mission and capabilities have changed over time.

One obvious task is the protection of the military and political-economic C³ which is a paramount requirement for an effective war effort. The specific measures to assure their protection are kept secret. The importance of providing such protection not only in the case of the political leadership but especially of military C³ is reflected in the following statement:

Under conditions of a nuclear war, the system for controlling forces and weapons, especially strategic weapons, acquires exceptionally great significance. A disruption of the control over the country and its troops in a theater of military operations can seriously affect the course of events, and in difficult circumstances, can even lead to defeat in a war.¹⁴⁶

According to various sources, the Soviets began to modernize and strengthen existing shelters or build new shelters and command posts for military leadership elements immediately following the end of World War II. This program, as these sources indicate, has been continued to the present time. It appears that the political and military command and control elements are provided with shelters both at their places of normal work and at command posts outside the cities.

According to Soviet statements, civil defense appears to be expected to contribute directly to the initial war-fighting capability of the Soviet armed forces. For example, according to Marshal Sokolovskiy,

The strategic importance of civil defense has increased tremendously as a result of the fact that, to a

¹⁴⁶Shirokov, *Voennaya Mysl'*, No. 11, November 1966, FPD Translation No. 0730/67, July 27, 1967, p. 63.

considerable extent, upon its effective organization and functioning depend not only the defense of the interior of the country, but also the mobilization of the armed forces during the initial phase of the war.¹⁴⁷

In a similar vein the then Deputy Chief of USSR Civil Defense, Colonel General O. Tolstikov, noted in 1964 that among the problems which civil defense will help to solve are: "mobilization, preparing reserves, ensuring the successful conduct of operations by the armed forces, damage control measures following nuclear attack, and certain others."¹⁴⁸

Presumably, the assistance that civil defense provides to the mobilization consists both in the protection of installations for it and of the transportation system. The problem of mobilization under nuclear war conditions has been a bothersome one and various Soviet military writers have suggested that it probably will be difficult to implement and that the armed forces must be prepared to fight the initial phase of the war with the forces available to them at the time of its outbreak. Nevertheless, Soviet military reservists still have specific instructions as to when and where to report in the event a mobilization is ordered. Similarly, doubts are expressed about the possibility to prepare stocks of materiel once the war has begun. Instead, Soviet spokesmen stress the importance of preparing in peacetime the material reserves necessary to sustain the initial phase of the war.¹⁴⁹

Concerning the role of civil defense in the maintenance of transportation as a vital requirement for the armed forces and the war effort, Tolstikov wrote:

In a future war, transportation will have enormous importance. Civil defense can render enormous aid to the military command in this area. Damaged bridges, railroad centers and other communications installations can be quickly restored by civil defense forces. All this

¹⁴⁷ Sokolovskiy, Voennaya Strategiya, p. 395.

¹⁴⁸ Tolstikov, Voennaya Mysl', No. 1, January 1964, FDD Translation No. 939, August 4, 1965, p. 25.

¹⁴⁹ For example, see Volkogonov et al., Voina i Armiya, p. 190; Ivanov, Voennaya Mysl', No. 5, May 1967, FPD Translation No. 0116/69, December 18, 1969, p. 56.

will facilitate the successful movement of troops to designated areas and will make it possible for troops to implement the required maneuver.¹⁵⁰

In addition, he pointed out that following enemy strikes, civil defense forces would be ready to conduct "rescue and priority emergency restoration work in a number of installations of the Ministry of Defense."¹⁵¹ Protection and restoration of transportation is but one of the elements of the logistic support of the armed forces and military operations to which civil defense is expected to contribute. As was noted, a primary mission of Soviet civil defense is to assure the "stability" of the national economy, i.e., its ability to function in wartime and to help supply the armed forces with additional weapons and equipment in order to assure Soviet military superiority during and at the termination of the war.¹⁵² The importance of the role of civil defense in assuring logistic support to the armed forces in the course of hostilities differs, depending on whether the war is short or protracted.

2. Soviet Views on the Significance of Civil Defense in Short and Protracted Wars

Soviet military doctrine anticipates the possibility of a war, including a nuclear war, between the opposing systems as being of a short as well as of a protracted duration. It is said that:

A nuclear war can be comparatively short in time, since the chief political and strategic goals can be achieved as a result of the massive use of strategic nuclear means and active operations by all types of armed forces in the basic theaters of military operation.¹⁵³

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Tolstikov, Voennaya Mysl', No. 1, January 1964, FDD Translation No. 939, August 4, 1965, p. 36.

¹⁵¹

Ibid., p. 37.

¹⁵²

Chuikov, Grazhdanskaya Oborona v Raketno-Yadernoi Voine, pp. 32-33.

¹⁵³

Lomov et al., Scientific-Technical Progress, p. 137.

At the same time, however, "it is also essential to consider those conditions which can lead to a relatively long and protracted war."¹⁵⁴

The short war obviously is the preferred one, but there is uncertainty about the ability of either side to achieve its objectives by means of the initial nuclear strikes. It is said, therefore, that Soviet military doctrine concludes that only "under certain conditions will a war be of short duration."¹⁵⁵

According to a 1969 Soviet scenario of an all-out nuclear war, it was anticipated that:

A most intensive exchange of nuclear strikes will occur, evidently, during the first days of war. Subsequently, as a result of the great expenditure of means of destruction, it is possible that there will be a decrease in the nuclear effect against deep regions, with continuation of an extremely active nuclear conflict in the theater of military operations. At this time, individual strikes can be inflicted by the surviving strategic forces (aircraft and nuclear submarines which did not succeed previously in entering the regions of fire positions) as well as the massed group and single strikes by operational-tactical nuclear means.¹⁵⁶

The possible length of the second phase of the war is uncertain. It would appear, however, that the ability of the sides to hold large strategic forces in security reserve could significantly lengthen this period. This would also be the case if one or

¹⁵⁴Ibid. See also Colonel General N. Lomov and Colonel S. Alferov, "On the Question of Soviet Military Doctrine," Voennno-Istoricheskii Zhurnal, No. 7, July 1978, p. 22.

¹⁵⁵Ivanov, Voennaya Mysl', No. 5, May 1967, FPD Translation No. 0116/69, December 18, 1969, p. 48.

¹⁵⁶Major General V. Zemskov, "Characteristic Features of Modern War and Possible Methods of Conducting Them," Voennaya Mysl', No. 7, July 1964, FPD Translation No. 0022/70, April 6, 1970, p. 20.

both sides retain a capability for producing additional strategic weapons or delivery systems in the course of the war and make use of them.

What length of time the Soviets have in mind when speaking of the possibility of a protracted war is not specified. There appear to be a number of reasons, however, why they believe a war could be protracted. First, the nuclear exchange may exhaust the strategic forces on both sides without achieving "victory," while the theater war will continue. Second, the initial phase of the nuclear exchange may fail to achieve decisive results and both sides may retain the capability to continue strategic operations at some, but lower, level of intensity. Third, the Soviets envision the war as a conflict between large coalitions of states, and the efforts needed to defeat all members of such coalitions may become protracted, especially if the core power of both coalitions is severely damaged and they have exhausted their strategic forces. Fourth, new active enemies may emerge in the course of the war or at the time of its termination. Fifth, some countries not involved in the war may become a potential threat at its termination and must be dealt with. Finally, even if the main elements of the enemy's military power are used up or destroyed, control over him, especially if he is geographically remote, may require further military actions over an unpredictable period of time.

The significance of civil defense differs to some extent in a short as against a protracted war. In both cases, it would attempt to assure national-system survival and to limit human and material losses as well as restore damaged facilities and enterprises. The difference lies in the direct contribution it would make to military operations and Soviet military power. In a short war, civil defense activities aimed at maintaining defense production are unlikely to have a direct impact on military operations. It would contribute to war fighting by its measures to preserve the political-military C³, transportation, and possibly by facilitating mobilization under war conditions. Civil defense would, however, make a significant contribution to the preservation of Soviet power and hopefully to Soviet military superiority at war termination.

In a protracted war, in which military operations could not be sustained from stockpiles and reserves prepared in advance, the role of civil defense in assuring logistic support to military operations would grow. It is said that "in the event of a world war being prolonged, then the capability of a country to build up its war production during hostilities will become a relevant factor."¹⁵⁷

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Skirido, Narod, Armiya, Polkovodets, p. 126.

In this situation, the criticality of additional production for defense and for sustaining the population would markedly increase, as would the requirements for the maintenance and restoration of transportation, communications, damaged utilities and essential industrial enterprises, redistribution of raw materials, parts, and so on. Since it is assumed that a main objective of each belligerent would be to destroy the economic capabilities of the enemy in order to deprive him of his ability to sustain his war effort, the struggle of civil defense to preserve and restore those capabilities will have a direct bearing on the further conduct and outcome of the war.

3. Civil Defense and the Preservation of National Morale as a Factor in War Fighting

The Soviets indicate that the problem of preserving morale among the armed forces and the population in the event of a war and maintaining their will to struggle until victory is a matter of major attention. It is asserted that one objective of strategic nuclear strikes will be the "undermining of the morale of the population," and that a collapse of national morale and resolve could result in a country's defeat. According to Grechko:

If the aggressive circles of monopolistic capitalism should unleash a war, it will take on an unprecedented fierce and destructive character. It will require the extreme exertion of moral and physical forces of the people, colossal endurance and steadfastness, and the ability to overcome enormous difficulties at the front and in the rear areas. Therefore, it is necessary to thoroughly prepare all the population for this eventuality.¹⁵⁸

A variety of approaches and programs are used in the Soviet Union to prepare the population for the "trials" of a possible nuclear war. This is one of the objectives of the Communist Party's propaganda and indoctrination activities. Among the specific programs is the "military-patriotic education" of the population and civil defense with its requirement for the compulsory training of the entire population.

The Soviet civil defense program contributes in several ways to the preservation of popular morale in wartime. First, it contributes to the "moral-psychological training of the population for the hard

¹⁵⁸ Grechko, Vooruzhennye Sily Sovetskogo Gosudarstva, p. 116.

test of a possible nuclear-missile war."¹⁵⁹ Specifically, it is said that one of its tasks is "to instill moral-psychological steadfastness and confidence in the reliability of methods and means of protection against weapons of mass destruction."¹⁶⁰ This is to be achieved by means of propaganda and the population's participation in instruction and training in civil defense. The objective is to explain to the population the existence of a threat of war and its possible character, and at the same time instill in it a belief that it can survive. Furthermore, the population is told that the Soviet authorities are undertaking the civil defense program for humanitarian reasons, out of concern for the safety of Soviet citizens, and that a war would be entirely the fault of the capitalist states and their allies. If a war were to occur, it would be, as the Soviets persistently assert, a "just war" for the Soviet Union, and it will be every citizen's patriotic duty to help wage it to a successful conclusion.

Second, civil defense contributes to the preservation of popular morale by limiting casualties and damage. While the Soviet leadership may be more callous in its attitude toward civilian and military losses than its Western counterparts, it nevertheless recognizes that massive casualties have an adverse effect on the morale of the people. While the point at which the losses cease to be bearable is uncertain, it nonetheless must be taken into account. Furthermore, the leadership expects to be given credit by the population for its foresight in trying to reduce losses and damage and for its concern for the people's safety.

Finally, civil defense measures intended to sustain the population during the war and to contribute to the country's post-war recovery will also have a favorable effect on popular morale.

¹⁵⁹ Milovidov, The Philosophical Heritage of V. I. Lenin..., p. 251.

¹⁶⁰ Krutskikh, Uchebno-Metodicheskoe Posobie, p. 4.

II. CRITICAL ELEMENTS OF THE SOVIET CIVIL DEFENSE PROGRAM

Within the Soviet civil defense program three elements are of special criticality. These are: the requirements for system survival and preservation of its command and control, protection of the population, measures for assuring the wartime viability of the economy and programs, plans and capabilities for post-attack recovery.

A. SOVIET REQUIREMENTS FOR SYSTEM SURVIVAL AND THE PRESERVATION OF COMMAND AND CONTROL

Soviet targeting doctrine assumes that both sides would target each other's political, administrative and economic command, control and communications systems in order to disrupt if not destroy them and paralyze the functioning of the state and its ability to wage war.

1. Soviet Views on the Requirement for System Survival

Since system survival is a critical objective of every belligerent in any war, it is natural that great attention is paid to the protection of the system as a whole and, in particular, to its most valuable and important elements. Methods of protection will depend on the nature of the threat and on the anticipated strategy of the potential enemy(ies). As a rule, first priority is given to the protection and preservation of the national command authority in order to assure its capability to function under war conditions. Already during World War II most countries' national command authorities were provided with shelters or bunkers to protect them from attack. Varying degrees of protection would also be extended to lower echelons of the political, governmental and economic apparatus.

For the first time in warfare, modern strategic forces pose a direct threat to the survival of a country's C³ and political system from the very outset of a war. Given the possible scale of such attacks, the problem is not only one of assuring the survival of the national command authority, but also of essential political, governmental and economic control elements at lower levels. Unless the latter are able to maintain control and implement the decisions and directives of the central authorities, the "viability" of the state and its capability to function in wartime would be jeopardized.

There is good evidence that the Soviets have and continue to pay attention to the problems of preservation of C³ and system survival at all levels. As the report on Soviet Civil Defense issued by the Director of Central Intelligence (DCI) in July 1978 indicates, the Soviet Union has been engaged in efforts to provide protection for leadership elements, from the national level down to urban districts (rayons) and for managers of "key installations." It

notes that:

Throughout the Soviet Union there is a pattern of shelter construction for this leadership. It consists of hardened underground shelters near places of work and relocation sites outside the cities.... The pattern of local shelters and relocation sites extends from government ministries to party headquarters and oblast and city governments and includes sites for major industrial enterprises as well.¹⁶¹

The report estimates this "leadership" category, which also includes members of the civil defense staffs, to consist of "about 110,000 people in all." This estimate, however, is based on a relatively narrow definition of the Soviet "leadership element." It does not attempt to define what the Soviets themselves consider to be the essential elements for system survival and effective wartime command and control. Unfortunately, the Soviets do not publicly discuss this question. Nor do the Soviets discuss what would be the minimum assured survival needed to maintain control and preserve the system.

Several approaches to this issue appear fruitful. One would be the examination of what elements of the party-governmental and economic apparatus the Soviets actually attempt to protect. Another would be an examination of the critical elements of the Soviet control system, and in particular its wartime organization.

2. Soviet Views on Problems of and Requirements for Effective Non-Military Command and Control in Wartime

The Soviet system is based on a largely centralized governmental administrative and economic command and control system which in turn is directed, supervised and permeated by the Communist Party. The key nodes of the system include organizations and individuals in critical decision-making, supervisory or coordinating positions. In wartime, the requirement for mobilizing all of the country's organizations, personnel and resources to support the war effort serves to further centralize the decision and management process. The criticality of continuous management and coordination

¹⁶¹Director of Central Intelligence, Soviet Civil Defense, NI78-10003, July 1978, p. 8.

is clearly recognized. For example, it is said that "an essential condition for assuring the viability of all sectors of the national economy is the creation in wartime of uninterrupted control over the economy."¹⁶²

Officially, the Soviet leadership expresses confidence in the loyalty of the Soviet population. This loyalty and appropriate behavior and attitudes on the part of the population are reinforced by the party's political indoctrination and propaganda activities, and by the military-patriotic and civil defense instruction programs. Of course, the party does not exclude the possibility of successful subversion of some individuals or elements of the population nor does it exclude a decline in popular morale as a result of enemy strikes. In the past such negative phenomena were countered by a combination of control by the Secret Police (KGB), supervision by party organizations and intensive "vigilance" and political propaganda. In practice, therefore, control over the population is exercised by party as well as governmental organizations and a variety of programs and measures designed to mold popular opinions and attitudes. Where normal controls are destroyed, such as was the case in the German-occupied Soviet territories during World War II, initial control over the liberated population and territories was exercised by the armed forces, including the military-party organization and elements of the KGB, until a territorial party organization and appropriate governmental-administrative organs could be reconstituted. This was achieved by a combination of responsible personnel sent from the center, and by the appointment of former party or governmental officials within the liberated territories serving in the armed forces, and the partisans, as well as the recruitment of personnel from among evacuees from those areas.

Despite Soviet acknowledgement of the potential subversion and morale problems among the population, this does not appear to be a primary concern in the matter of the preservation of wartime command and control. There is no indication that the Soviet leadership is seriously worried about the possibility of revolt among some segments of the population, notably ethnic minorities. Whether it excludes such a possibility entirely cannot be determined, but it is unlikely, given Soviet experience with such revolts during World War II. Furthermore, the seriousness of this problem as an issue for Soviet wartime command and control may be discounted for a number of reasons:

a. Political unrest is unlikely under conditions of a nuclear war during which no area of the Soviet Union will be safe and

¹⁶² Sukhoguzov, "The Problem of the Viability of the Economy in Modern War," Kommunist Vooruzhennykh Sil, No. 3, February 1972, p. 15.

consequently all elements of the population will be concerned with their own survival.

b. Civil defense measures for the protection of the population (sheltering in-place and evacuation and dispersal) will tend to fragment the population and isolate its elements from each other, as well as increase its dependence for its support and safety on the government and, in particular, on the local authorities. The Soviet experience during World War II showed food rationing, among other things, to be a highly effective instrument of control of the population.

c. Given that the party-governmental control apparatus at all levels is given the best protection, it is also most likely to survive.

d. The significance of any unrest or revolt will depend on its location and the specific elements of the population involved in such activities. While the authorities are likely to be very sensitive to disruptive popular activities in areas and among elements believed to be essential for sustaining the war effort, the occurrence of such activities in other areas may be viewed as temporary and tolerable, to be dealt with if and when the Soviet Union successfully concludes the war.

It is possible and even likely that the Soviet leadership has a differentiated attitude to the value of ethnic groups and territories in terms of systems survival and requirements for support of the war effort. In other words, the leadership may give priority to the preservation of what may be called the historic Soviet "heartland," i.e., the RSFSR, Ukraine and Belorussia, which are most closely identified with Russian nationalism and the Party and contains the highest proportion of party members and the bulk of Soviet industry. Disruption or loss of control in other areas may be regarded as less crucial for the survival of the system and for sustaining the war effort. The Soviet experience, both in the early years of its existence and during World War II, would tend to confirm this. If the system survives in the "heartland," then it will be able to reestablish its control over the peripheral territories. If the war is lost, then the loss of control over some of the ethnic minorities will have no further significance.

e. Rebellion of ethnic minorities or other elements of the population is unlikely in the absence of an enemy ground invasion which promises protection and support to the rebels. The threat of an invasion, however, comes not from the West as was the case in World War II, but from China. In such a case, the ethnic minorities along the Chinese border or in Soviet Central Asia are more likely to be hostile to the Chinese rather than regard them as "liberators."

f. There is no evidence that the Soviet authorities expect a long-term breakdown in communications between the central authorities and various geographic or ethnic regions, which might stimulate a movement for political autonomy or independence. Soviet discussions of the possibility of temporary isolation of geographic regions, or more precisely of the "breakdown of ties" between regions, are in terms of transportation and economic relations rather than political control.

What appears to concern the Soviet authorities the most is the preservation of effective command and control for the purpose of management of the war and the war effort. The Soviets recognize the great complexity of this task, which requires not only top-level decisions but also the preservation of low-level authorities and organizations for the implementation of these decisions. At the same time, the lower-level authorities must keep the higher ones informed about the situation in their area of responsibility, so as to permit an effective allocation of remaining human and material resources.

Inevitably, as will be discussed in greater detail below, efficient command and control for the management of the war effort under conditions of nuclear strikes will require the physical concentration of authority and of information processing. This may constitute a problem in wartime, given the possible destruction of such key command posts at various levels. However, below the national level there will be alternate, if more cumbersome, channels of authority.

A particularly critical problem for the effective operation of the command and control system will be the requirement for maintaining reliable and continuous communications. Without communications the command and control systems not only break down, but from the point of view of those it controls, ceases to exist. Furthermore, the ability of the authorities to communicate to subordinate organizations and the population is perceived by them as direct evidence that they are able to continue to exercise control. An interruption of such communications can lead to panic in subordinate organizations, cessation of vital activities and to a dangerous loss of control over the population.¹⁶³ This is an area

¹⁶³For example, see L. Goure, The Siege of Leningrad (Stanford, Cal.: Stanford University Press, 1962 and 1978), passim; H. S. Dinerstein and L. Goure, Two Studies in Soviet Controls: Moscow in Crisis (Glencoe, Ill.: The Free Press, 1955), pp. 195-225.

of serious Soviet concern, all the more so because communication centers are expected to be targeted by the enemy, and because other means, such as the detonation of large-yield nuclear weapons at high altitude or other jamming methods may be used to disrupt communications. Soviet discussions of this problem indicate that at least some of the communications system is protected against EMP.¹⁶⁴ The Soviets may expect that great redundancy of military and civilian communications systems would reduce the probability of any protracted breakdown in communications.

3. Critical Elements of the Soviet Control System in Wartime

In peacetime, while national command authority rests with the Politburo and the Party's Secretariat subordinated to it, the lines of control below that level follow a number of different tracks: the party organization, the Council of Ministers and individual ministries and state committees at the national and republic levels, the soviets at all levels, various economic organizations, the KGB, and the armed forces. Although the Soviet Union has a federal structure, "the CPSU is not a federation of national communist parties, but a single, all-union communist organization."¹⁶⁵ The CPSU cuts across all other Soviet organizations, governmental-administrative, economic, military, and so on, by maintaining party organizations within these organizations. At the same time, the governmental and economic organizations at the national level and below exercise direct control over all organizations and installations subordinated to them.

The Soviet control and management system, therefore, requires both the party and the governmental-economic organizations, the first to direct and supervise, the latter to manage and implement the leadership's /i.e., Party/ decisions, plans and policies. Control is, therefore, simultaneously along horizontal /i.e., party/ and vertical /i.e., government-economic administration and management/ lines. Consequently, while authority and control are highly concentrated at the top of the system, below this level there are multiple and, to some extent, competing lines of authority and control. Depending on perceived needs, the authority of lower party organizations vis-a-vis government and economic management can be strengthened or relaxed, as has happened at various times in Soviet history. The party organizations, however, do not

¹⁶⁴ Lieutenant General A. Dunin, "Postwar Development on the Ground Forces," *Voenno-Istoricheskiy Zhurnal*, No. 5, May 1978, p. 38.

¹⁶⁵ *Organizatsionno-Ustavnye Voprosy KPSS (Organizational-By-Laws Questions of the CPSU)* (Moscow: Politizdat, 1978), p. 9.

substitute for government-economic management. Indeed, there is a tendency of the latter to regard party control as superfluous and interfering. A breakdown of party organizations at lower levels, therefore, should not result in a paralysis of government-economic management and control.

The significant elements of control below the top national leadership level are the party secretaries of party committees and bureaus and the chairmen and their deputies of the executive committees of the soviets at all territorial-administrative levels, as well as the economic managers from the ministerial levels (national and republic), down to individual installations and enterprises, transportation sectors, etc.

In terms of importance, it appears that the party committees and executive committees of the soviets at the republic levels and down to the urban and rural districts (rayons) are especially significant. In all, there are some 5,800 such executive committees (ispolkoms) at these levels, and they are paralleled by an equal number of party organizations. The number of ministries at the national and republic levels and of other government and economic organizations and managements down to important sectors, installations and enterprises is still larger.¹⁶⁶

At grass root levels the elements of control which affect the population most directly include: the management and party organizations at places of work, the housing administrations at places of residence, the district (rayon) party committees and executive committees of the soviets, and various agencies, such as the police. In wartime, an important element of control becomes the food rationing system, which is tied to types of employment and the value of individuals to the regime. This gives the party and management enormous clout vis-a-vis the working population, because dismissal could mean being relegated to the lowest ration category which, under severe circumstances, may be equated with starvation.

Under war conditions, the immediate critical control element at lower levels in terms of support for the war effort are the economic and service managers, economic and transportation coordinating agencies, the civil defense staffs and the city and district

¹⁶⁶For example, see Presidium of the Supreme Soviet of the USSR, SSSR, Administrativno-Territorial'noe Delenie Soyuznykh Respublik (USSR, Administrative-Territorial Division of Union Republics) (Moscow: "Izvestiya Sovetov Deputatov Trudyashchikhsya SSSR," 1974), p. 5; S. Rothman and G. W. Breslauer, Soviet Politics and Society (St. Paul, Minn.: West Publishing Co., 1978), p. 204.

executive committees of the soviets. It will be they rather than the party organization or the KGB who will implement the economic war mobilization plans, manage the population-essential services and resources, and deal with the effects of enemy strikes. They can operate without supervision by party organizations or the KGB, although the leadership is likely to be uneasy about the reliability and effectiveness of their activities without party supervision.

Inevitably in wartime authority and control will be more concentrated than in peacetime. Under nuclear war conditions, this will be due not only to the centralization of authority for more effective direction and management of the war effort, but also to the need to protect command and control. One result of this will be the establishment of key protected command posts in which essential leadership elements will be collocated. Thus, there will be both operational and physical concentration of authority and control organizations. It is said that:

In order to raise the stability of command and control under conditions of a missile-nuclear war there are already created in peacetime reserve points of control, which are located outside the zones of possible destruction. The reserve points of control are equipped with protected communication centers and appropriate apparatuses which assure stable communications with subordinate organizations. In addition, it is planned to create duplicate control points.¹⁶⁷

During World War II national authority was centralized in the State Defense Committee (GKO). At present there is a Defense Council (SO) which is currently headed by Brezhnev. In World War II the GKO had "emergency plenary powers ... for maximum utilization of the economic, social-political, spiritual, foreign policy and especially military capabilities of the country in the interest of defeating the Fascist aggressors," and its decisions were "obligatory" for all party, governmental, and military organizations and the population.¹⁶⁸ The most important function of the GKO, which included Politburo members as well as government, economic and military leaders, was to mobilize human and material resources,

¹⁶⁷ Egorov et al., Grazhdanskaya Oborona, p. 147.

¹⁶⁸ Major General S. A. Tyushkevich, editor, Sovetskoe Vooruzhennye Sily (Soviet Armed Forces) (Moscow: Voenizdat, 1978), p. 266.

determine the allocation and utilization of these resources, and assure logistic support of the armed forces. It is likely that in the event of a nuclear war the SO or a reconstituted GKO will perform similar functions, and will operate in a single location.

Below the national level the command and control system appears to be tied into the Soviet civil defense organization. That is so because the Soviet civil defense organization is "based on the country's state organization" and in particular on "the structure of organs of state authority and state management."¹⁶⁹ Specifically, the heads of the territorial civil defense organizations are the heads of the councils of ministers of republics, and of the executive committees of the soviets at all levels below.¹⁷⁰ Similarly, the party committees at each level are directly involved in supervising these civil defense organizations.¹⁷¹

Consequently, at republic, oblast, city, city district and rural district levels the appropriate representative of the party, the executive committees of the soviets, their deputies and other key administrative personnel will be located at the facilities of their respective civil defense staffs. In wartime these officials, assisted by their staffs, will have control over all civil defense measures, allocation of resources, economic activities in their area of control, post-strike rescue, damage-limiting, as well as emergency repair and restoration activities, and so on. These staffs will also receive and process information on the damage and losses inflicted by the enemy. On the basis of this information, they will set priorities and allocate resources and manpower within the framework of the existing human and economic mobilization plans, which go into effect at the outbreak of hostilities. A similar situation will apparently prevail at ministries, economic and transportation organizations and various installations. There also, the administrative-managerial leadership, along with their party secretaries, technical specialists and civil defense staffs, will be assigned to specific command posts at their places of work or at relocation points outside the cities.

While this concentration of key leadership elements is required for effective control and management under conditions of enemy strikes, it may constitute a vulnerability. The destruction

¹⁶⁹ Krutskikh, Uchebnoe-Metodicheskoe Posobie, pp. 10-11

¹⁷⁰ Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, p. 14.

¹⁷¹ Ibid.

of such command posts or the failure of their communication system may disrupt the chain of command. The Soviets attempt to guard against this by providing these command posts with strong blast shelters and, as far as possible, concealing their locations. The DCI report notes that in the case of top leadership, there is a system of multiple shelter command posts, possibly in the hope of concealing its actual location.¹⁷²

Whether alternate command organizations and posts exist at the various lower levels, as is suggested in Soviet publications, is uncertain. It is possible that there are such organizations at the national and republic levels and for critical economic and transportation agencies to ensure the continuity of command and control in the event of the destruction of the primary organizations. At lower levels it may be possible, in the event of the destruction of the primary command posts, for subordinate staffs to temporarily take over their functions, or for superior staffs or even staffs in adjacent geographic areas to do so. For example, there is a report of an instance where an oblast civil defense command post was given control over several adjacent oblasts during an exercise. Of course, once the nuclear attack ceases or is reduced to occasional single strikes, the surviving authorities will be able to reconstitute the destroyed leadership organizations, as well as use other organizations and channels for control over and management of reconstruction and recovery activities.

At the enterprises and installations which will continue operating in wartime, the Soviets plan for each to have two command posts. One will be at each enterprise or installation, the other at the relocation sites to which their work force has been dispersed. Both will be manned by the enterprises' managerial and technical personnel and will be in constant communications with each other. The enterprises' directors, in their capacity as chiefs of civil defense for their organizations, will be located at the out-of-city command posts, while their deputies will man the command posts at the enterprises.

In assessing the potential vulnerability of the Soviet wartime political-economic command and control system, it would be incorrect to assume that any particular element of it is irreplaceable, or could not be reconstituted in fairly short order. This will hold true for the top leadership as well as for lower level organizations. For example, not all Politburo members are likely to be in the same command post as the GKO, and the same holds true

¹⁷²DCI, Soviet Civil Defense, p. 9.

for the Party's Secretariat, the Council of Ministers, or elements of the CPSU Central Committee. The same will be the case for republican level organizations. At oblast and district levels, the key command posts will not include all members of the party committees or of the executive committees of the soviets, etc.

While replacement for destroyed primary organizations may be possible, a critical question will be whether the command posts of the elements which replace them will be equipped in the appropriate manner to allow them to exercise effective management and control. This will be of critical importance, at least during the period of intensive enemy strikes when the entire leadership element will be in shelters. Once the leadership element is no longer physically pinned down by the attack, it will be able to reconstitute destroyed elements of control and replace lost personnel.

Control over appointments to leadership-management positions is exercised by the party on the basis of what is called a nomenklatura system. This system consists of lists of positions, the filling of which must be approved by appropriate party committees, and of lists of potential candidates considered qualified to hold such positions. The positions to which the nomenklatura system applies include not only the party organization, but also the government, the economic system, significant posts in the armed forces, trade unions and other "public organizations," the mass media, police, and so on. Furthermore, there is, as a matter of Soviet practice, a high degree of interchangeability between party, government and economic personnel. Thus, provided that key party committees and the nomenklatura lists survive, the system is capable of rapidly reconstituting destroyed leadership elements and organizations and filling posts which have become vacant. No doubt, the destruction of all elements of the national, and to a lesser extent, the republican, leaderships would have serious consequences for continuous control under war conditions. The nomenklatura system does not apply to the top leadership and it has been the practice of the Politburo to coopt its members and central committee secretaries. Presumably, however, the top leadership will attempt to guard against such a calamity.

Finally, on the question of population control in wartime, it should be noted that:

a. In wartime the country operates under conditions of martial and wartime laws, which impose extremely harsh punishment for any violation of "discipline" or "hostile" behavior, or actions which can be interpreted as failure to support the war effort. In accordance with the Soviet constitution, every citizen is required to work to support, assist and strengthen the country's defense.

b. If the urban population is evacuated prior to an attack, the evacuees, along with the rural population, will find in-place the rural party committees, executive committees of the soviets and rural district civil defense staffs which control, among other things, the rural and evacuated police forces. These control organizations will be reinforced by the evacuated city and city district party and executive committees and their civil defense staffs and forces. In addition, the evacuees will be grouped and resettled according to their place of work and thereby will remain under the direct control of their managers, their party organizations and any KGB representative on the management staff. The evacuees, therefore, will be subject to a multi-layer interlocking and overlapping control system, which is expected to survive at least as well, and in most instances better, than the evacuees and rural residents themselves.

c. As was noted, the dependence of the population on the authorities for food and essential services, and in particular the wartime food rationing system, will provide the leadership element with great leverage on the population and will be an important instrument of control.

d. An additional element of control would be provided by the armed forces, which would play a significant role in the entire system of wartime civil defense and post-strike operations.

4. The Military-Civilian Command and Control Interface Below the National Level

As was noted, the protection of the homeland against enemy attacks and dealing with their effects is the "joint mission" of the armed forces and civil defense. It is claimed that "close interaction of the armed forces and civil defense is a tradition and an important factor for joining efforts for achieving the set goal."¹⁷³ It is also asserted that USSR Civil Defense was created by the leadership "to strengthen the armed forces and enhance their combat readiness."¹⁷⁴

¹⁷³ Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, p. 13. See also Altunin, Sovetskaya Voennaya Entsiklopedia, Vol. 3., p. 24; Krutskikh, Uchebno-Metodicheskoe Posobie, p. 8; Tolstikov, Voennaya Mysl', No. 1, January 1964, FDD Translation No. 939, August 4, 1965, p. 35.

¹⁷⁴ Tolstikov, Voennaya Mysl', No. 1, January 1964, FDD Translation No. 939, August 4, 1965, p. 28.

According to Soviet statements, "in modern conditions the close coordination of the armed forces and civil defense is required."¹⁷⁵ This is so because both have the mission of protecting the homeland and its ability to wage war, because they assist each other in the execution of their specific missions, and also because they may share facilities and services or assist each other in their restoration. Soviet sources cite many examples of such interaction or cooperation. For example, civil defense depends on the air defense forces for warning of an attack and may share with the military communication systems and facilities in disseminating the warning and for "constant control of troops and civil defense forces."¹⁷⁶ Civil defense and the armed forces will coordinate their requirements for use of transportation during the evacuation of the urban population. They will cooperate in the repair of damaged lines of transportation, communication systems and power supply systems, in conducting post-strike rescue and emergency repair operations in areas of nuclear destruction, in the allocation and use of materiel and supplies and the maintenance of essential services.

It is noted that "the civil defense rescue operations at the oblast and republic levels are unthinkable without close coordination with the military command" and that "detailed coordination of plans with the armed forces is a primary condition for the correct supervision of civil defense forces" in the event of an attack.¹⁷⁷ Military units, primarily civil defense troops, will not only cooperate with civilian formations in dealing with the destruction caused by enemy attacks, but the military will render other services in support of civil defense. For example, it may assist in providing the evacuated urban population with shelters, water, food and fuel, in building roads to relocation areas, in supplying electric power to key installations and enterprises which have been deprived of power, in providing medical facilities and assistance to civilian casualties, etc.¹⁷⁸ It is noted that the armed forces may provide

¹⁷⁵ Ibid., p. 35.

¹⁷⁶ Ibid., p. 36; Lieutenant Colonel Ye. Galitskiy, "The Coordination of Civil Defense With Units of the Armed Forces," *Voennaya Mysl'*, No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 47.

¹⁷⁷ Tolstikov, *Voennaya Mysl'*, No. 1, January 1964, FPD Translation No. 939, August 4, 1965, p. 37.

¹⁷⁸ Galitskiy, *Voennaya Mysl'*, No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, pp. 47-52.

communication facilities to civil defense organizations which have lost their own facilities and that the "armed forces can be of great assistance to organs for the maintenance of public order, both in the evacuation zones and especially in the centers of destruction."¹⁷⁹ In short, the Soviet armed forces play an active and important role in the implementation of passive defense measures and in post-strike repair and recovery.

The armed forces also enter the picture from the viewpoint of wartime control systems in the country. First of all, civil defense and the armed forces are under "single military command" at the national level.¹⁸⁰ Second, it is said that "the successful implementation of civil defense measures depends to a great extent on the effective leadership and assistance of military commanders at all levels and on the close cooperation between the military command and the leadership of civil defense."¹⁸¹ In particular, below the national military command, which will direct civil defense, it is expected that a significant role will be played by the military districts and naval districts. There are 16 military districts and four naval districts, and the commander of each one has a deputy for civil defense and forces, equipment and materiel which can be used in support of civil defense and the maintenance of control. Third, as was noted, the chiefs of civil defense staffs and much of the staff personnel at republic, oblast and large city levels are military men. In a sense, therefore, the civil defense staffs will have two lines of command--one through the civil defense command structure, and the other through the military districts and their subordinate military commands.

In principle the military commands play an important support role in civil defense and economic-population control, but do not replace the civilian political, governmental or economic authorities. It would appear, however, that in practice under conditions of a nuclear war the military could, and in fact would, play an important role in in-country command and control. For example, military commands may temporarily substitute for destroyed civil defense command posts, taking control of both military and civilian civil defense forces and directing essential post-strike rescue and repair operations, assisting the population, distributing supplies,

¹⁷⁹ Ibid., pp. 51-52.

¹⁸⁰ Kulikov, *Voennye Znaniya*, No. 5, May 1974, p. 3; Altunin, *Sovetskaya Voennaya Entsiklopediya*, Vol. 3, p. 24.

¹⁸¹ Altunin, *Sovetskaya Voennaya Entsiklopediya*, Vol. 3, p. 24.

etc. Given that support of war fighting is a priority task of the country as a whole, the military commands may set priorities for repair and restoration activities, for determining which enterprises and services will be given assistance and resources to continue their operations, allocate surviving reserves and manpower, operate the communication system, etc. In addition, as noted, the military can exercise direct control over the population by "independently" policing the latter with troop units when regular police organizations are unable to cope with this task.

In the final analysis, the role of the military in in-country command and control will depend on the extent to which the party, government and economic control system will be able to function and effectively deal with the wartime problems and tasks. There is no reason to believe that the military are anxious to step into the civilian control and management process. They are likely to do so, however, if this becomes necessary to assure their ability to carry out their primary mission of waging war.

B. SOVIET PRIORITIES AND MEASURES FOR POPULATION SURVIVAL

According to Soviet public pronouncements on civil defense, first priority is given to the protection of the population. It is claimed that:

Assuring the security of Soviet people was and will be at all times the main objective of all defense measures of the Soviet state. From the successful solution of tasks for protecting the population depends the successful solution of other tasks of civil defense. V. I. Lenin pointed out that "the first productive force of all mankind is the worker, the toiler. If he survives we will save and restore everything, but we will perish if we fail to save him...."¹⁸²

It is also pointed out that human resources "represent a most important element in the economic and military-economic potential of any country."¹⁸³ Consequently, when the Soviets list the primary mission of civil defense, protection of the population is always in first place. Indeed, the Soviets like to emphasize, as Brezhnev has done, that civil defense is primarily a humanitarian undertaking, intended

¹⁸²Krutskikh, Uchebno-Metodicheskoe Posobie, p. 9. See also Altunin, Lyudi i Dela Grazhdanskoy Oborony, p. 8.

¹⁸³Cherednichenko, "Modern War and Economics," p. 24.

to protect innocent and peaceful Soviet citizens from "imperialist aggression."¹⁸⁴ This public line serves both the purpose of showing the leadership's concern for the population, while at the same time allowing it to claim that the Soviet civil defense program in no way destabilizes the U.S.-Soviet strategic balance or is indicative of Soviet aggressive intentions.

From a practical point of view, however, Soviet measures to protect the population are by no means uniform. These measures differentiate between persons or organizations in terms of their value to the system and the war effort and also in terms of the probability that a particular location would be targeted for nuclear strikes by the U.S.

1. Soviet Priorities for Population Protection

There has been a tendency to rank Soviet priorities for protection of the population according to leadership elements, essential work force and general population.¹⁸⁵ The essential work force is defined as that employed at "key economic installations," which presumably will continue functioning in wartime. According to Soviet plans, the personnel of such enterprises, except for those called up for military service, will be divided into two 12-hour workshifts, which will rotate between the enterprises and the workers' assigned relocation sites outside the target areas. Soviet civil defense plans provide that these enterprises and essential service installations have shelters with sufficient space for one wartime workshift. The general population category apparently applies primarily to the urban population, and includes everyone not belonging to the leadership element or essential workers.

This classification of the Soviet population and civil defense priorities in providing protection omits various important elements which the Soviet leadership is highly interested in preserving. This category falls between the leadership element and the essential workers and comprises a variety of organizations and employees believed to be important for the implementation of policy, control and management, security, public morale and generally for sustaining the war effort and for postwar reconstruction. In a sense, this category could be called an "elite," although not all people employed in such organizations are high ranking.

¹⁸⁴ For example, see Brezhnev, answers to questions by Vorwaerts, TASS, May 2, 1978; Altunin, "The Valuable and Leading--Into Practice," p. 18.

¹⁸⁵ DCI, Soviet Civil Defense, pp. 2, 8-9.

The Soviets persistently make the point that "structurally, the country's defense capability represents a combination of economic, sociopolitical, moral, scientific and military potentials of the state."¹⁸⁶ Or again, the Soviets say that "the defense capability of the state depends not only on the might of its army and navy, but also on the state of its economy, science and technology, the size and composition of its population, and its readiness for modern war."¹⁸⁷ The Soviets do believe in the importance of protecting and preserving these elements of the "country's defense capability," or more precisely, the institutions and personnel able to contribute to that end.

Although the Soviets do not define the organizations and personnel who fall into this category, they can be deduced from Soviet civil defense measures. According to available information, blast shelters are constructed at various institutions on a priority basis. Included are party organizations dealing with party control, propaganda and agitation; economic control and management organizations; transportation control agencies; police organizations; important scientific, research and academic institutions; laboratories and design bureaus; urban hospitals and important medical institutions; and urban secondary and vocational schools. Shelters are built for these institutions and organizations not only in the large cities, but also at the special sites where they are concentrated, as for example in the case of Akademgorodok, near Novosibirsk.¹⁸⁸ Many of these organizations and institutions are expected to continue their operations in wartime, and have assigned relocation areas outside the potential target cities to which they will be evacuated and where they will continue their activities.

¹⁸⁶ Major General S. Tyushkevich, "Fruits of Creative Labor Under a Reliable Protection," Kommunist Vooruzhennykh Sil, No. 11, June 1976, p. 12. See also Colonel N. Kulikov, "Laws of War: Essence, Peculiarities," Soviet Military Review, No. 11, November 1978, p. 3; Colonel N. Mal'tsev, "In the Interest of the Country's Defense Capability," Voennyi Vestnik, No. 8, August 1978, pp. 6-9; Colonel B. Lytov, "Defense of the Socialist Fatherland--Most Important Function of the Soviet State," Vestnik Protivovozdushnoi Oborony, No. 6, July 1979, pp. 12-13.

¹⁸⁷ Krutskikh, Uchebno-Metodicheskoe Posobie, p. 13. See also "Military Potential," "Scientific Potential" and "Economic Potential," Sovetskaya Voennaya Entsiklopediya, Vol. 6 (Moscow: Voenizdat, 1978), pp. 473-477.

¹⁸⁸ See also interview with V. Promyslov, Chairman of the Executive Committee of the Moscow Soviet, "Solving Big-City Problems," New Times, No. 26, June 1976, p. 26.

In theory one could define the "general population" as that element which is viewed by the leadership as being non-essential. In practice, however, when civil defense shelter requirements are taken into account this is not the case. This is so because "elite" personnel and essential workers are scattered throughout the cities. True, there is a tendency for large enterprises to build housing developments for their own workers, but this does not mean that all employees of these enterprises reside in such developments. Consequently, even while providing shelters for the "elite" and one work-shift of "essential workers" at their places of work, additional shelter space is needed to protect these elements when they are not at work and also to protect their families. The result is that while priority apparently is given to construction of shelters at the institutions and enterprises whose personnel should be protected, shelters are also built in residential buildings and preparations are made to provide shelter space for large numbers of urban residents in large dual-purpose facilities such as subways, underground garages and mines.

2. Protection Measures for the "Essential" Elements of the Population

Soviet protection measures for the population are provided in a "differentiated" manner, in accordance with two basic criteria: the importance or value of an organization, installation or enterprise and the probability that it will be targeted by an enemy. It is said, therefore, that:

The plans provide that workers and employees of major cities and important national economic installations who continue to work in wartime as the basic production force are to be given cover in shelters which protect them against all destructive effects of nuclear weapons.¹⁸⁹

Or again, it is specified that:

Shelters are build primarily in cities which are the most likely targets of weapons of mass destruction, mainly nuclear, and must be located near the places where the people to be sheltered are.¹⁹⁰

Altunin, while noting that modern shelters "must protect against destructive factors of nuclear and chemical weapons,"

¹⁸⁹Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, p. 20.

¹⁹⁰Krutskikh, Uchebno-Metodicheskoe Posobie, p. 19.

called for civil defense to aim at providing "the entire population of cities and installations against which the use of nuclear means is most likely with such shelters."¹⁹¹ He pointed out that the great territorial size of the USSR precluded it being blanketed by nuclear explosions. "Consequently," wrote Altunin, "the strength of the shelters, undoubtedly, will depend on the importance of the region on whose territory they are built."¹⁹²

Even though the Soviets do not appear to expect the enemy to strike cities per se, major cities are believed to be likely targets for attack because of the concentration in them of important political, governmental and economic command and control organizations, as well as significant industrial enterprises, scientific and research institutions, and large numbers of valuable personnel. Presumably, the greater the concentration of high value targets in specific cities, the more likely it appears that these cities will be attacked, thereby endangering their residents. There are indications, therefore, that the Soviets have established a ranking system for their cities in terms of their importance, in particular, their value to national-system survival and support of the war effort, and in accordance with estimates of probability that they may be targeted. Presumably, highest priority for protection of the population is given to cities which are likely to be the targets of multiple nuclear strikes.

Aside from a differentiated treatment of cities in terms of civil defense priorities, the Soviets also provide differentiated degrees of protection to elements of the population in accordance with their value to the system and the war effort and their location in relation to probable targets for attack. This is most clearly reflected in both the degree of hardness as well as availability of blast shelters.

According to Soviet sources, shelters are classified "in terms of their protective properties, capacity, location, availability of filter-ventilating equipment, and in terms of time of their construction."¹⁹³ Specifically, their classification is broken down as follows:

In terms of protective properties, shelters are divided into five classes according to the degree of protection they provide against the shockwave of nuclear detonation.

¹⁹¹ Altunin, Lyudi i Dela Grazhdanskoy Oborony, p. 8. /Emphasis added/

¹⁹² Ibid., p. 9.

¹⁹³ Egorov et al., Grazhdanskaya Oborona, p. 60.

In terms of capacity (number of persons taking shelter), shelters are divided into: small--up to 150 persons, medium--for 150 to 450 persons, and large--for over 450 persons.

In terms of location, shelters can be built-in or separate standing. The built-in shelters include those located in the basements of buildings, and the separate-standing ones are those located outside of buildings.

In terms of filter-ventilating equipment, the shelters can have factory-built ventilating equipment or simplified equipment made from available materials.

In terms of time of construction, shelters are either built ahead of time, in peacetime, or rapidly erected and built at the time of a threat of an attack.¹⁹⁴

Soviet publications do not specify the "five classes" of shelter hardness. They do, however, mention the existence of super or extra-hard shelters designed to withstand high-blast overpressures and capable of accommodating "several thousand" persons. It is said that such shelters may be located 20 to 40 meters or more underground and they they would be able to survive near or at ground zero of a nuclear detonation.¹⁹⁵ Such shelters are primarily for the use of top leadership elements. They are probably built as C³ command posts, outside the cities. It has been estimated that they may be hardened to withstand on the order of 1,000 psi blast

¹⁹⁴ Egorov et al., Grazhdanskaya Oborona, second edition, p. 178, and third edition, p. 60. The third (1977) edition omits mention of five classes of shelter hardness and merely states that in terms of their resistance to blast, "shelters are divided into classes." See also M. D. Bodanskiy et al., Raschet Konstruktsii Ubezishch (Shelter Construction Calculations) (Moscow: Stroyizdat, 1974), p. 11.

¹⁹⁵ V. P. Sinitsyn and G. A. Malin, Zashchita ot Sredstvo Massovogo Porazheniya (Protection Against Means of Mass Destruction) (Moscow: Uchpedgiz, 1958), p. 91; A. S. Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya (Special Questions in Architectural-Construction Design) (Moscow: Stroyizdat, 1977), p. 94; L. F. Supron and F. P. Zverev, Meditinskoe Obespechenie Naseleniya v Usloviyakh Primeneniya Sredstv Massovogo Porazheniya (Medical Service for the Population Under Conditions of the Use of Weapons of Mass Destruction) (Moscow: Gosizdat, 1959), p. 308.

overpressure.¹⁹⁶ In addition, the leadership element appears to be provided with very hard shelters at their regular places of work as well as at their residences. Civil defense staffs at the republic, kray, oblast, large city and city district levels are also provided with blast shelters at their peacetime location and at out-of-city command posts. Furthermore, the Soviets apparently expect to improve the survivability of their command posts by means of secrecy and concealment of their locations, and, at least in the case of the top leadership, by having ready alternate facilities so as to make the precise location of the top leaders difficult to determine.¹⁹⁷

It is unclear whether very hard dual-purpose shelters are included in the "five classes" of hardness of Soviet shelters. Of particular significance in this category are deep systems such as subways, mines, pedestrian and transportation tunnels and deep heavily reinforced garages, which are also designated as shelters. While Soviet sources acknowledge that deep subway stations and tunnels are highly blast resistant, no indication is given about their actual assessed hardness. It appears probable, however, that in many instances deep sections of the subways and other deep underground dual-purpose structures are able to withstand well over 150 psi blast overpressures. There are subway systems in Moscow, Leningrad, Kiev, Baku, Tbilisi, Tashkent and Kharkov. The largest is in Moscow (over 164.5 kilometers of tracks) and has been estimated to be able to accommodate up to 35 percent of that city's population.¹⁹⁸ There are also indications that in many cases important party-government leadership institutions have direct underground access to the subways, and that other underground complexes have been built in connection with the subways to serve as communication centers and for economic and special storage purposes.

Concerning permanent blast shelters for a broad segment of the population, according to Soviet publications, they are said to be designed to withstand from 0.5 kg/cm² to 10 kg/cm² (i.e., 7.1 to 142 psi) blast overpressure.¹⁹⁹ Presumably, these hardness figures

¹⁹⁶For example, see The New York Times, January 3, 1977; the Joint Chiefs of Staff, letter to Senator W. Proxmire, January 28, 1977, in the Congressional Record - Senate, January 31, 1977, p. S1780.

¹⁹⁷DCI, Soviet Civil Defense, p. 2.

¹⁹⁸Ibid., p. 9.

¹⁹⁹P. G. Yakubovskiy, Grazhdanskaya Oborona (Moscow: Prosveshchenie, 1972), p. 26. Other Soviet publications mention ranges of 0.5 to 5 kg/cm².

represent the pressures at which the shelters will show no deformation or failure and not the pressures at which they will actually collapse. One factor determining the hardness of specific shelters is the load which their roofs are required to bear in the case of industrial enterprises and the weight of the collapsed building above them in the case of basement shelters in office and residential buildings. This Soviet design requirement indicates that shelters under industrial buildings with heavy machinery and under high-rise buildings will be designed for high ranges of hardness (100-150 psi or more).²⁰⁰ Shelters in the high ranges of hardness will be built at enterprises which will remain in operation in wartime and which presumably will be in danger of being targeted by the enemy. Since, according to Soviet sources, quickly erectable shelters, which may be built in a crisis to supplement existing permanent shelters, are hardened in the range of 0.7 to 3 kg/cm² (9.9 to 42.6 psi) blast overpressure,²⁰¹ it appears likely that in most cases the permanent basement and detached blast shelters are hardened in the range of 3 to 10 kg/cm², or more.

In terms of priorities in allocation of shelters, these are found first of all at "elite" institutions, industrial enterprises, communication centers and hospitals. According to Soviet plans, industrial and service enterprises which will continue operating in wartime are required to have sufficient shelter space at the enterprise or nearby to protect one wartime workshift. At most academic institutions there should be sufficient shelter space not only for the faculty, but also for students. The availability of shelters for "elite" elements and essential workers at their places of residence does not appear to be uniform. It seems to depend on a variety of factors such as: whether the city is believed to be a priority target for enemy attack, whether the workers and elite elements live in specially-assigned housing, the date of construction of their residences, whether alternate shelters exist nearby (for example, subways), and so on. Generally, in major cities it appears that multi-story apartment buildings or residential micro-*rayons* built since the late 1960s are more often than not provided

²⁰⁰ For example, see Il'yashev, *Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya*, pp. 117-122; L. Goure, *Shelters in Soviet War Survival Strategy* (Washington, D.C.: Advanced International Studies Institute, 1978), p. 15.

²⁰¹ F. I. Ostroukh, *Stroitel'stvo Bystrovozvodimykh Ubezhisheh: Protivoradiatsionnykh Ukrytii* (Construction of Quickly Erectable Shelters and Anti-Radiation Covers) (Moscow: Voenizdat, 1972), pp. 25, 45-46; Yakubovskiy, *Grazhdanskaya Oborona*, p. 30.

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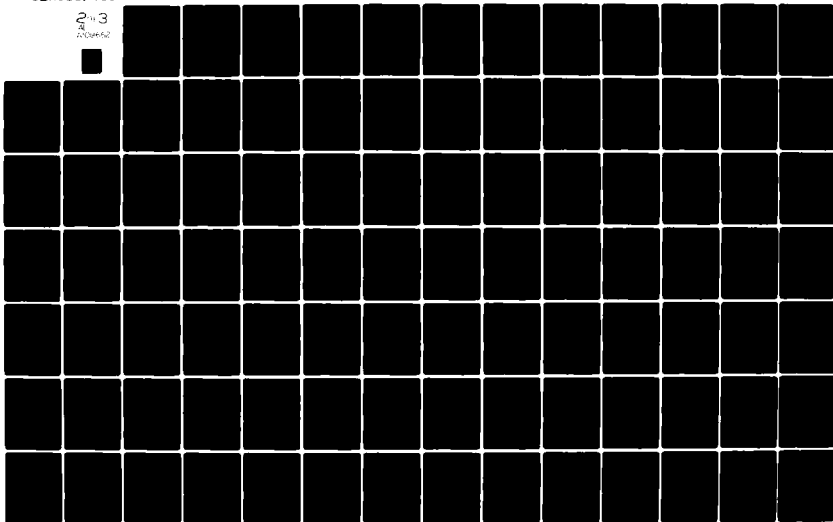
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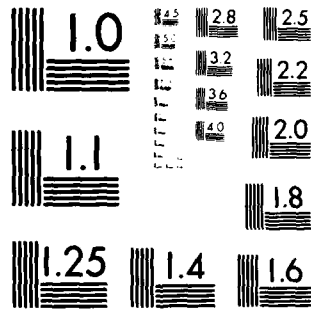
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MICROCOPY RESOLUTION TEST CHART
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with shelters.

Another form of protection of valuable personnel is its evacuation and dispersal to sites outside the target areas. While this is no longer viewed as being the primary method of protection of residents in likely target cities and installations, as was the case during the 1960s, it is still expected to be carried out if circumstances permit. In the case of working people, the evacuation and dispersal is organized and carried out by their places of employment. It is not unlikely that in an emergency the important agencies, institutions and enterprises will be given priority in carrying out the evacuation of their personnel, and they are best organized and ready to do so.²⁰²

3. Civil Defense Measures to Protect the General Population

Protection of the general population, i.e., of that element of the urban population which is either not working or is employed in unimportant and non-essential organizations and enterprises, apparently is provided in accordance with the likelihood that a particular city will be targeted for attack. Where such a threat is believed to exist, the general population may be provided with a combination of shelters at work, at residences, in public places (public buildings, subways, mines, etc.). This element of the population will also be subject to pre-attack evacuation, organized through places of work or the housing administrations. With the exception of children, who would be sheltered at school or evacuated with their parents or by their schools, this element is given lower priority in the provision of shelters. To the extent that such individuals have immediate family members who have priority in evacuation, they will accompany such members. Otherwise, they may find themselves without assigned shelter spaces or scheduled to evacuate late and, if they are not infirm, on foot.

As noted, in cities which are considered important and most likely to be targeted for attack, shelter availability, including dual-purpose shelters, may be widespread and, in general, sufficient to protect the great majority or all of the residents. This may not be the case, however, in cities with lower priorities. There shelters will exist for the leadership element and for the elite and essential industrial or service workers at their places of work, but the availability of residential shelters will be more limited. Shelter construction in such cities for use by the general

²⁰²See Goure, War Survival in Soviet Strategy: USSR Civil Defense, pp. 80-119; Egorov et al., Grazhdanskaya Oborona, pp. 81-97; Colonel Zaytsev, "For Those Who Teach: An Important Method of Protection," Voennye Znaniya, No. 8, August 1978, p. 28.

population and other elements may be on the increase, but such construction appears to have been long neglected in cities which, during the 1960s, were not assigned priority for protection and believed to be of lesser importance or faced with a lower probability of multiple weapon strikes.

According to Soviet plans, residents of towns which are not believed to be priority targets for attack will only require improved or rapidly erected anti-radiation shelters.²⁰³ In principle, residences near important installations or enterprises which are likely targets for nuclear strikes should be provided with shelters. It is not clear how uniform this practice is in the Soviet Union. It appears to depend to a considerable extent on the time period when the residences were built. For example, buildings built during the 1950s in major cities were frequently provided with basement shelters. Those built during the 1960s incorporated such shelters less often. Those built during the 1970s were again more likely to have shelters.

It generally appears that at the present time the proportion of urban residents who could be sheltered varies considerably in accordance with the importance attributed by the Soviet authorities to particular cities and installations. It also varies depending on whether people will be at work or not, because the Soviets have given priority to the construction of shelters at places of employment. It would appear, therefore, that more people could be sheltered at present in the event of a daytime attack than at night. Of course, in a crisis the Soviets may convert to a war-time work regime, in which case more people are likely to be at work around the clock, especially at industrial enterprises. Of course, in a crisis, the authorities may also order a partial or full-scale evacuation of residents in potential target cities. In such a situation, it is likely that there would be sufficient ready shelter space for all residents who will be in the target areas at the time of an attack.

Concerning the survivability of Soviet shelters, there are at present a number of uncertainties. One area of such uncertainty is the actual hardness of Soviet shelters, which is difficult to assess without a great deal of information on the details of their construction. Published Soviet hardness figures are not reliable and are cited mostly in the form of examples rather than for the purpose of providing information on real shelter hardness. Furthermore, although the Soviets have developed standard shelter designs,

²⁰³ Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, p. 20; Altunin, Lyudi i Dela Grazhdanskaya Oborony, p. 9.

there are likely to be variations in the quality of their actual construction as well as in the quality of building materials used. Soviet publications generally discuss shelter survivability in terms of a surface detonation of a one megaton warhead. Even so, they do not provide such estimates for the entire range of Soviet shelter hardnesses over various distances from ground zero.²⁰⁴ Tables published in Soviet civil defense manuals correlate weapon yields, blast overpressures, and distances from air and ground bursts. They indicate that for example:²⁰⁵ a 50 kt detonation will generate 1 kg/cm² (14.2 psi) blast overpressure at a distance of 0.6 km from an air burst and 0.7 km from a surface burst; a 100 kt detonation will generate 1 kg/cm² blast overpressure at a distance of 1 km from an air burst and 1.2 km from a surface burst; a 1 mgt detonation will generate 1 kg/cm² blast overpressure at a distance of 2.2 km from an air burst and 2.9 km from a surface burst.

The Soviet tables, however, do not indicate what the estimated overpressures would be at ground zero for detonations of nuclear weapons with various yields. While the DCI report provides no information on the weapon yields and Soviet shelter hardness assumed in its analysis, it estimates that "75 to 90 percent of the people in urban shelters would be adequately protected from the blast and other prompt effects of a nuclear attack that was intended to maximize damage to industrial and military targets."²⁰⁶ This estimate apparently assumes a high survivability of occupants of industrial shelters as well as of shelters at other key installations.

Even if occupants of Soviet shelters have a high probability of surviving the prompt effects of nuclear detonations, under present conditions there are limitations on the length of time people can remain in the shelters. One reason for this appears to be a shortage of manufactured filter-ventilation equipment whose production apparently does not keep pace with shelter construction. This shortage is more likely to occur in shelters in residential buildings. Another problem is the lack of foodstocks in the shelters, especially those in residential buildings. These shortcomings can

²⁰⁴For example, see M. V. Kachulin, Beseda s Naseleniem o Grazhdanskoy Oborony, (Conversation With the Population About Civil Defense) (Moscow: Atomizdat, 1970), p. 26.

²⁰⁵Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 27; Egorov et al., Grazhdanskaya Oborona, p. 153.

²⁰⁶DCI, Soviet Civil Defense, p. 9.

be remedied to a considerable extent with sufficiently long strategic warning of an attack, but would pose significant problems in the event of a sudden, unanticipated need for the population to take cover in shelters.

Another factor which will affect the safety of the population in the event of an attack is the proportion of urban residents, including essential workers, who would have to be accommodated in rapidly adapted basements and other ready underground structures, and in hasty, detached shelters preferably built of prefabricated concrete or reinforced concrete ducts and conduits, blocs, slabs or plates, etc., covered with one or more meter of earth. The latter shelters will be equipped with sand-gravel filters and simple manually or foot-pedal operated fans. As was noted, according to Soviet publications, such shelters may be able to withstand blast overpressures in the range of 10 to 42 psi.²⁰⁷ These shelters will be less blast resistant than the permanent shelters, and will not be equipped for prolonged occupancy.

According to Soviet publications, such shelters may be built in a crisis, not only to supplement ready shelters for the general population, but also at installations and enterprises where existing shelters are unable to accommodate the entire workshift. One consequence of this may be, therefore, that unless there will be sufficient space at enterprises and installations which will continue their operations in regular blast shelters, a part of the workforce will have to be given cover in less well hardened and equipped, rapidly erected shelters. Consequently, they may be at greater risk than the other workers. What proportion of the population and workforce may be forced to make do with such shelters will vary from locality to locality and enterprise to enterprise, depending not only on earlier Soviet priorities in shelter construction, but also the extent to which they had actually been implemented.

4. The Role of the Armed Forces in Population Survival

Soviet sources indicate that the armed forces will actively assist the civil defense forces in the implementation of various measures for the protection of the population. Such assistance would not be necessarily limited to the military civil defense

²⁰⁷ Egorov et al., Grazhdanskaya Oborona, pp. 69; 280-283; M. Katsenel'son, "A Trench Became a Shelter," Voennye Znaniya, No. 8, August 1978, p. 31; Goure, Shelters in Soviet War Survival Strategy, pp. 24-25.

troops, but many include a variety of other military units and their equipment.²⁰⁸

As was noted, the public warning system of civil defense depends on signals received from the National Air Defense forces. Military forces may also assist the civil defense forces in maintaining critical communication links and transportation routes, and so on. Soviet sources, however, mention other areas of cooperation between the armed forces and civil defense.²⁰⁹ For example, it is suggested that this assistance will be necessary for traffic control and road maintenance during the evacuation of cities and in the preparation of relocation areas to sustain the evacuees, i.e., the military may help build rural roads, prepare reserves of water and other supplies. Military units and equipment may be used to supply power to rural hospitals, bakeries and other facilities used by the evacuees; they may provide medical assistance and open military hospitals to civilian casualties. It is said that they may assist the evacuated population in building fall-out shelters, especially where the ground is frozen or rocky, and military living facilities may be opened for use by evacuees. The military forces will also play an important role in post-attack rescue operations in the zones of nuclear destruction, in restoring water supplies in the event of the destruction of water systems and reservoirs, and, if necessary, may temporarily feed, clothe and otherwise provide essential support to the survivors. Soviet publications point out that the armed forces have a tradition of providing emergency assistance to the population in wartime, and given their present direct involvement in civil defense, such assistance is more likely than ever before to be planned for and implemented.

C. SOVIET PRIORITIES AND MEASURES FOR ECONOMIC VIABILITY

According to Soviet pronouncements "the economy is of decisive significance for the attainment of victory in war and therefore its development in peacetime and preservation during a war is one of

²⁰⁸ For example, see Altunin, Lyudi i Dela Grazhdanskoi Oborony, pp. 14-15. According to Altunin, the Ministry of Defense, the General Staff of the Armed Forces, and the military councils, commanders, political organs and staffs "pay daily attention" to civil defense.

²⁰⁹ For example, see Lieutenant Colonel Ye. Galitskiy, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, pp. 47-52; Tolstikov, Voennaya Mysl', No. 1, January 1964, FDD Translation No. 939, August 4, 1965, pp. 28-37.

the fundamental tasks of the state."²¹⁰ A primary mission of civil defense, therefore, is to "carry out measures aimed at raising the stability of operations of the installation of the national economy in wartime."²¹¹ It is noted that "assuring the 'survivability' of the economy is fundamental for the transformation of the military-economic potential into a real factor for achieving the aims of the war."²¹²

According to the Soviet definition, "stability of operation of and installation" means:

... the ability to produce the required types of production in the amount and assortment prescribed in the wartime plans, and also the capability to rapidly restore production, which has been disrupted as a result of the enemy's use of weapons of mass destruction and other means of attack.²¹³

The capability to restore production is further defined as referring to conditions of light or medium-heavy damage or the disruption of essential service to the enterprise, such as electric power, gas, water, fuel, etc.²¹⁴ Of course, assuring the "stability" of the economy refers not only to essential industrial enterprises and agriculture, whose production is needed to sustain the armed forces and the population or to help repair the damage and replace losses from enemy strikes, but also to critical services such as transportation, communications, electric power, water systems, etc. Furthermore, it is pointed out that measures for assuring the operating stability of the economy are planned and implemented not only at individual enterprises and installations, but "on the scale of each branch" of the industry and "the entire economy."²¹⁵ Some Soviet

²¹⁰Egorov et al., Grazhdanskaya Oborona, p. 144. See also Volkogonov et al., Voina i Armiya, pp. 155-156.

²¹¹M. N. Titov, P. T. Egorov, and B. A. Gayko, Grazhdanskaya Oborona, (Civil Defense) (Moscow: Vysshaya Shkola, 1974), p. 94.

²¹²Sukhoguzov, "The Question of Viability of the Economy in Modern War," p. 10.

²¹³Krutskikh, Uchebno-Metodicheskoe Posobie, p. 48.

²¹⁴Titov et al., Grazhdanskaya Oborona, p. 94.

²¹⁵Altunin, "Principal Stages and Directions of Development of USSR Civil Defense," p. 44.

publications go further and include city planning as well as questions of planning and development of suburban areas as significant factors in the "stability" of the economy.²¹⁶

As was noted, the Soviets place great emphasis on the protection of the economy, and especially of its key elements for a number of reasons. First, they see a critical requirement for continuous logistic support of the armed forces during a war and especially in the event of a protracted war, which will require additional production of weapons, equipment and other essential military supplies. Along with this, it will be necessary to assure that the population be sustained in wartime, given that it is the most important "productive force" needed to maintain critical production. Second, as the Soviets insist, the economic potential is a fundamental factor in national power and the outcome of the war will depend on the "correlation of economic forces" between the belligerents, both at the start and in the course of the conflict.²¹⁷ Relative economic advantage, therefore, will play a significant role in determining the character of the "victory," postwar power relations and relative rates of recovery. The Soviet objective is for the USSR to emerge from the war in a clearly stronger position than any of its actual or potential adversaries, and its strength will be reflected in both its military as well as economic capabilities at war's end. Finally, the economy must be capable of assuring Soviet military superiority over the defeated enemies as well as non-belligerents. This will be essential not only in order to assure the dominant position of the Soviet Union after the war, but to allow it to control the international environment to its advantage, and to prevent any potential enemy from being tempted to take advantage of a military weakening of the Soviet Union and attack it. Of course, the survival of significant elements of the economy is also critical for the preservation of the Soviet system and its domestic controls, and for popular morale and support of the regime.

1. Soviet Views on the Essential Elements of the Economy and Their Vulnerabilities

The Soviets recognize that the growing complexity of the economy and the interdependence of its elements increase the difficulties of assuring its ability to operate in wartime and its survival. Even so, some elements of the economy are of greater

²¹⁶For example, see Egorov et al., Grazhdanskaya Oborona, pp. 146-150; Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, pp. 45-70.

²¹⁷Volkogonov et al., Voina i Armiya, pp. 155-156.

criticality for effective support of a war effort than others, and some are also more likely to be targeted by the enemy for nuclear strikes than others. As was noted, Soviet spokesmen assert that during a war targets for nuclear strikes are selected first of all on the basis of the effects that their destruction would have on the "progress of armed combat" and the "functioning of the state" and their relative criticality for a country's economic potential.²¹⁸

As a general category which is said to determine the relative power of a state, both in peacetime and during a war, is the so-called "military-economic potential." According to a Soviet definition:

The military-economic potential of a country comprises the same elements that are found in the economic potential, that is, human resources for use in the armed forces and in defense production, the ability of a country's national economy to supply its armed forces with the required weapons of war, etc. The foundation of a state's military-economic potential is its defense economy, or that part of the state's economy charged with producing arms and military equipment and also with supplying the armed forces with other national resources.²¹⁹

The defense economy, or "military economy," in turn is categorized as follows:

A modern military economy usually comprises: a defense industry--basic industry (supply of power, raw materials and other materials), military assembly industry (manufacture of units, assemblies and finished elements), and a military-production industry (production of finished consumption items); supplies of strategic raw materials and other materials; a portion of agricultural production (supplies of food for satisfying requirements during wartime); a portion of state transportation, etc.²²⁰

²¹⁸Shirokov, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, pp. 33-39.

²¹⁹Cherednichenko, "Modern War and Economics," p. 21.

²²⁰V. Volchok, "Problems of Defending the Achievements of Socialism: The Foundation of the State's Defense Power," Krasnaya Zvezda, November 17, 1971.

Included are also essential workers, technicians, scientists, managerial personnel, etc., who operate and work in such economic activities. According to some Soviet sources, however, "all heavy industry," and not just the defense industry, should be considered as constituting the "basis of the military power of a state."²²¹

Of course, the peacetime and wartime defense economy will differ a great deal. This will be so because of the war mobilization of the economy which will result in the rapid conversion of civilian enterprises to defense production, the closing down of non-essential civilian production, sharp changes in the allocation of raw materials and supplies, etc.

Soviet discussions of the critical elements of their economy appear to indicate the following order of priorities in terms of these elements' significance for war fighting and preservation of national power:

a. Economic Command and Control. Operation of the economy in wartime will require close and continuous supervision, control and coordination. The Soviets point out, therefore that:

The improvement and increased stability of control /i.e., control and management/ deserve special attention because the disruption of control, even for a short period, will have a negative effect on the activities of the national economy.²²²

The requirement for the preservation of economic command and control applies to all levels, from the national down to individual enterprises and installations, which continue operating in wartime--transportation sectors, agricultural production units, etc.²²³

b. Power. The Soviets make clear that they regard electric power as the most critical element of the economy. It is noted "the preservation of the power system on which the entire activity of society depends is of particularly great significance."²²⁴ Or again, it is said that:

²²¹Cherednichenko, op. cit., p. 21.

²²²Egorov et al., Grazhdanskaya Oborona, p. 146.

²²³Ibid., p. 12; Krutskikh, Uchebno-Metodicheskoe Posobie, p. 54.

²²⁴Volkogonov et al., Voyna i Armiya, p. 190.

The question of the development of the power system of the country and the stability of operations of power sources deserve serious attention, because the disruption of normal electric supply to industrial and other enterprises will result in their standstill.²²⁵

Presumably for this reason, it is asserted that:

Power stations, particularly large ones, are ... advantageous targets because power-consuming and very important defense industry enterprises (chemical, aluminum and manganese plants, and others) are frequently situated near them. This will make it possible, along with the destruction of the electric power stations, to put out of action many other important enterprises, and also electrified transport.²²⁶

Furthermore, the destruction of a portion of the power plants, substations and transformer stations, as well as transmission lines "can also disrupt the coordinated operation of the still undamaged sections or circuits of the power supply system" and, as is noted, the repair of heavily damaged power systems will require a great deal of time.²²⁷ Soviet sources warn that the chances of severe disruption of the electric power system are increased if key power stations or substations, as well as major long-distance transmission lines, are located in zones of likely destructions, i.e., in localities most likely targeted by the enemy. While the major power producing equipment is relatively blast resistant, it is vulnerable to damage caused by flying debris from the surrounding structures.²²⁸

The supply of gas is also important because some enterprises use it as fuel, while others, such as chemical plants, use it in their

²²⁵ Egorov et al., Grazhdanskaya Oborona, p. 146. See also Krutskikh, Uchebno-Metodicheskoe Posobie, p. 51. See also Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 65.

²²⁶ Shirokov, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 37.

²²⁷ Galitskiy, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 50.

²²⁸ Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, pp. 65-66.

production processes. As in the case of electric power, one problem is the protection of gas pipelines, and special distribution, drying, etc., stations. Here again, allowing long distance lines and key stations to be located in likely target areas increases their vulnerability and the probability of disruption of the gas supply. An additional problem is that of gas storage, which needs to be protected.²²⁹

c. Transportation. The Soviets believe that the transportation system will play a critical role in wartime. It is essential for moving troops, equipment and supplies for the armed forces, to relocate the population from urban areas and to sustain the economy as well as carry its output to consumers. It is asserted, therefore, that modern economy cannot function without transportation and that "if one or more key branches of the transportation network are put out of action, the entire economic life of the country is disrupted and, consequently, its military potential will be sapped or significantly weakened."²³⁰ Consequently, the Soviets say that the country's transportation system is highly likely to be targeted by the enemy and must be expected to suffer extensive damage.²³¹ It is noted that enterprises which depend on parts or raw materials from distant points will be directly affected by the disruption of transportation, which will also be the main cause of the possible isolation of regions from each other. Of particular concern are possible strikes against and destruction of choke points (nodes) on the transportation routes, i.e., rail centers and marshaling yards, transshipment points, rail and highway bridges, tunnels, and train ferries, as well as river and sea ports.²³² Of particular significance would be the disruption of the Soviet railroad system, which in peacetime carries the major part of Soviet freight and passengers. Furthermore, at present about 41,000 km of Soviet rail lines (out of a total of some 140,000 km), are electrified and nearly half of the total railroad locomotives are electric.²³³ Soviet civil defense

²²⁹Egorov et al., Grazhdanskaya Oborona, p. 170.

²³⁰Shirokov, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 37.

²³¹Sukhoguzov, "The Problem of Mobility of the Economy in Modern War," p. 12.

²³²Shirokov, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 38; Sokolovskiy, Voennaya Strategiya, p. 394.

²³³K. Kulaev, "Railroad Transport: Problems, Prospects," Kommunist Vooruzhennykh Sil, No. 12, June 1979, p. 17.

publications also note that metal and reinforced concrete bridges are hardened in a range of 2 to 10 kg/cm² (28.4 to 142 psi) blast overpressures, while highways will suffer severe damage at levels of 30 kg/cm² (426 psi) blast overpressure.²³⁴

d. The Defense Industry. Although Soviet publications do not discuss the Soviet defense industry as such, it is obviously regarded as being critical to the war effort and is certain to be targeted by the enemy. No doubt, of special significance are those specialized enterprises whose activities and equipment cannot be effectively duplicated by less specialized plants. This may be the case of enterprises engaged in the production of nuclear materials and weapons, missile and electronic assembly plants, plants producing missile fuel or explosives or making armor plates and casting tank turrets, special precision instrumentation plants for missiles, aircraft or submarines, etc. The sensitivity of the chain of production steps required to produce finished weapon systems is noted in Soviet publications. For example, one analyst warns that:

Even the destruction of individual, especially important plants, have a great effect on the output of certain types of military production. For example, it is sufficient to destroy a few enterprises producing transistors in order to extremely restrict the production of missiles for all branches of the armed forces.²³⁵

Of course, in the Soviet Union, the line between defense and non-defense industries is quite fuzzy. Great numbers of enterprises which are mainly engaged in non-defense production have shops or departments producing for defense. Frequently this defense production is unrelated to the primary products put out by the enterprises.

e. Oil Industry. The Soviets recognize that oil plays a critical role in modern war and that the oil industry is a primary target for enemy strikes. It is noted that refineries and storage facilities are especially vulnerable to thermal radiation from nuclear detonations and secondary fires.²³⁶ It is said, however,

²³⁴Egorov et al., Grazhdanskaya Oborona, p. 134; M. P. Tsivilev ed., Inzhennernye Raboty v Ochage Yadernogo Porazheniya (Engineering Work in a Center of Nuclear Destruction) (Moscow: Voenizdat, 1968), p. 15.

²³⁵Shirokov, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 37.

²³⁶Egorov et al., Grazhdanskaya Oborona, p. 156.

that oil pipelines as well as gas lines are "least vulnerable," presumably if they are buried in the ground.²³⁷

f. Chemical Industry. One Soviet source points out that "of all the other branches of heavy industry, the chemical industry should be singled out in particular. Some of its enterprises are exceptionally important and extremely vulnerable."²³⁸ Of particular concern appear to be petrochemical enterprises and chemical plants producing for the armed forces and transportation. Furthermore, chemical enterprises pose a threat of causing secondary damage to nearby installations and people.

g. Metallurgical Industry. It is said that installations of the metallurgical industry can be "profitable targets."²³⁹ One must distinguish, however, between the metal producing and the machine building industries. The former types are unlikely to have a direct effect on the conduct of the war, unless it becomes protracted, even though they are very important for the economy as a whole and for postwar recovery. One Soviet analyst appears to suggest that as a matter of priority, these types are profitable targets "if the enemy is experiencing significant difficulties in supplying metal, and if his metallurgical industry is heavily concentrated."²⁴⁰ In such a situation, he claims, strikes against large blast furnaces, coking ovens, converters and plants producing high grade steel and non-ferrous metals used in defense production "can produce a decisive effect." Furthermore, the large size of such enterprises and the massiveness of their equipment make them difficult to protect, while protection is feasible in the case of medium and light machine building industries which can make an immediate contribution to the war effort.²⁴¹ Indeed, many of these plants appear to be

²³⁷ Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 14. It is noted that water and gas mains will withstand 28.4 psi blast overpressure and be totally destroyed at 213 psi. Egorov et al., Grazhdanskaya Oborona, p. 154.

²³⁸ Shirokov, Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 38.

²³⁹ Ibid.

²⁴⁰ Ibid.

²⁴¹ Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 14; N. P. Krechetnikov and N. P. Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, (Civil Defense at Machine-Building Enterprises) (Moscow: Mashinostroenie, 1972), p. 86.

partly involved in defense production in peacetime and could rapidly convert to full-scale defense production in wartime.

h. Electronics Industry. The significance of the electronics industry for defense is self-evident. As was indicated earlier, the Soviets recognize that the destruction of major components of this industry can adversely affect the production of missiles and other critical weapon systems. It appears, however, that no clear distinction can be drawn between defense and non-defense electronic enterprises. Many of the latter are to varying extents producing components and assemblies for the armed forces.

i. Reserves and Stockpiles. Although Soviet spokesmen ascribe great importance to the role of the economy in wartime and to measures to assure its "stability," they are uncertain about how much of the economy will survive and how well it will be able to function in support of the armed forces. This will be a particularly serious problem during the initial phase of a nuclear war, which, the Soviets believe, is likely to be especially violent and destructive. It is said, therefore, that:

At the very outbreak of a nuclear war, the economies of the belligerent nations will be subjected to large-scale destruction. Therefore, one can no longer assume that supply to the combat forces can be assured by mobilizing the nation's economic resources as the war progresses. The course and outcome of a nuclear-missile war will also be determined by stores of weapons, combat material, gear, ammunition, foodstuffs, strategic raw materials, etc., which have been stockpiled before the war.²⁴²

Precisely because of the uncertainties attached to the feasibility of carrying out economic mobilization in the course of a nuclear war, "the main concentration for the resolution of the problem of logistic support of the Soviet armed forces" is the creation of appropriate reserves and stockpiles in advance of a

²⁴²Skirdo, Narod, Armiya, Polkovodets, p. 126. See also Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 13; Sokolovskiy, Voennaya Strategiya, p. 388.

war.²⁴³ In addition, reserves and stockpiles are needed to sustain the population and to repair and restore damaged installations and services. Consequently, ready reserves and stockpiles are said to be of "decisive significance" for the attainment of "strategic successes from the start of the combat operations."²⁴⁴ Significantly, it is pointed out that "in modern war, the problem of the preservation of material reserves acquires special significance."²⁴⁵

In their discussions of the reserves and stockpiles that are said to be required for "economic readiness for war," the Soviets mention not only military weapons, equipment and supplies, but also strategic raw materials, fuel, food, industrial machinery, transportation equipment, semi-finished goods, spare parts, and consumer goods.²⁴⁶ They recommend that industrial enterprises, primarily those which will be required to continue operating in wartime, maintain their own reserves of fuel, spare parts, raw materials, semi-finished goods, etc.²⁴⁷ It is noted, concerning military stockpiles that they pose problems because of the rapid obsolescence of weapons

²⁴³ Ivanov, Voennaya Mysl', No. 5, May 1969, FPD Translation No. 0016/69, December 18, 1969, p. 50. See also Major General A. Muzychenko, "Comprehensively Develop the Theory of Military Economics," Voennaya Mysl', No. 8, August 1971, FPD Translation No. 001/74, February 28, 1974, pp. 64-65; Colonel Taran, Voennaya Mysl', No. 6, June 1971, FPD Translation No. 0015/74, March 12, 1974, p. 53.

²⁴⁴ Captain Second Rank B. G. Grigor'ev, Ekonomicheskii i Moral'nyi Potentsialy v Sovremennoi Voine (Economic and Moral Potentials in Modern War) (Moscow: Voenizdat, 1970), p. 68. See also Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 13.

²⁴⁵ Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 13.

²⁴⁶ Volkogonov et al., Voina i Armiya, p. 190; P. V. Sokolov editor, Voенно-Ekonomicheskie Voprosy v Kurse Politekonomiy (Military Question for the Course in Political Economics) (Moscow: Voenizdat, 1968), p. 15; Army General E. E. Mal'tsev, editor, KPSS-Organizator Zashchity Sotsialisticheskogo Otechestva (The CPSU-Organizer of the Defense of the Socialist Fatherland), second edition (Moscow: Voenizdat, 1977), p. 330.

²⁴⁷ For example, see A. Kornienko, "Economic Mobilization Aspects Discussed," Politicheskoe Samoobrazovanie (Political Self-Education), cited in JPRS, Translations on USSR Military Affairs, No. 623, July 6, 1970, pp. 42-43; Colonel V. Kozlov, "Development of Soviet Society and the Strengthening of the Country's Defense," Kommunist Vooruzhennykh Sil, No. 22, November 1972, p.8.

and equipment. This, it is said, results in a contradiction between the need for reserves and the requirement for supplying the armed forces with the most modern weapons.²⁴⁸ Still, it appears practical to maintain sufficient stocks to sustain the armed forces at least during a "fast moving" or first phase of a war.²⁴⁹ Non-military stockpiles, however, are less sensitive to obsolescence. Food supplies require to be replaced to maintain their freshness, but much of the equipment would remain valuable even if it is to some extent obsolete. Indeed, it may be difficult in the post-attack period to make effective use of highly sophisticated and complex equipment and machinery. Consequently, there may be an advantage in stockpiling simpler models of older design.

2. Soviet Measures to Protect the Economy

Soviet spokesmen recognize that the problem of improving the viability of the economy in a nuclear war is difficult and complex and that its solution is costly and requires long lead-times. There is no doubt about the importance attributed to measures to protect the economy in Soviet public pronouncements and publications. Indeed, this has been and continues to be a persistent theme in statements by Soviet military as well as civil defense spokesmen, including high ranking ones such as Grechko, Sokolovskiy, Kulikov, etc.

While the Soviets make clear not only their intention to protect the economy, but also the types of measures they believe are necessary for it, there is at present considerable uncertainty about the precise extent to which these measures have been implemented.²⁵⁰ This contradiction between intelligence findings, albeit preliminary, and stated Soviet intentions and requirements require resolution. Indeed, it is difficult to believe that the Soviets, having developed a comprehensive civil defense program and invested considerable resources into personnel protection, would fail to implement such an important program as the protection of the economy. There are also indications from various sources that in fact the Soviets have done far more in this area than has been allowed for in published intelligence assessments.

Concerning Soviet measures to protect the economy, it should be noted that passive and active defense priorities appear to largely coincide. The Soviet listings of priority targets which should be protected by the National Air Defense forces (PVO Strany),

²⁴⁸ Grigor'ev, Ekonomicheskii i Moral'nyi Potensialy v Sovremennoi Voine, p. 68.

²⁴⁹ Ibid.

²⁵⁰ For example, see DCI, Soviet Civil Defense, p. 10.

include "the most important installations of the national economy and important population centers," as well as "lines of communication" [i.e., transportation], "important political and administrative centers," "energy resources" and entire "economic regions."²⁵¹ Of course, priority is given to those centers and installations which are believed to be most essential for the preservation of C³ and for continuing logistic support of the armed forces. Civil defense measures, however, can be applied more broadly, including installations and elements of the population which are unlikely to be targets of direct enemy strikes, but nevertheless require protection against radioactive fallout and other effects of a nuclear attack.

The Soviet passive defense program to protect the economy includes a wide array of measures which may be used singly or in various combinations. Essentially, they consist of hardening, dispersal, concealment and readiness for large-scale post-strike, damage-limiting and emergency repair and restoration activities. One aspect of the program, namely the protection of the economic control and management system, as well as of technical personnel and essential workers by means of sheltering in-place and pre-attack evacuation and dispersal, was described above. The other categories of specific measures for the protection of the economy and assuring its ability to function in wartime include:

- a. Selective hardening of entire enterprises.
- b. Partial hardening of select enterprises and important support installations.
- c. Measures to reduce the vulnerability of enterprises and important installations to secondary damage.
- d. Emergency hardening of critical machinery and equipment.
- e. Geographic dispersal of enterprises and important installations.

²⁵¹ Zimin, Razvitie Protivovozdushnoi Oborony, p. 184; A. S. Mal'gin, Upravlenie Ognem Zenitnykh Raketnykh Kompleksov (Fire Direction of Anti-Aircraft Missile Complexes) (Moscow: Voenizdat, 1975), p. 5; Bagramyan, Istoriya Voin i Voennogo Iskusstva (The History of War and Military Art) (Moscow: Ministerstvo Oborony, 1970), p. 499; Sokolovskiy, Voennaya Strategiya, p. 359; Marshal of Aviation G. V. Zimin, "The Experience of the Great Fatherland War and the Present," Vestnik Protivovozdushnoi Oborony, No. 5, May 1976, p. 16; Colonel N. Komarov, "National Air Defense in the Postwar Period," Vestnik Protivovozdushnoi Oborony, No. 4, April 1977, p. 56.

- f. Duplication of critical enterprises.
- g. Duplication of energy inputs to enterprises and important installations and preparation of standby emergency energy sources.
- h. Preparation for emergency relocation of select enterprises to prepared hardened and/or dispersed sites outside the anticipated targets for enemy nuclear strikes.
- i. Readiness for rapid shutdown of equipment.
- j. Measures to protect the transportation system and assure rapid repair of damage.
- k. Stockpiling of fuel, food, raw materials, spare parts, machinery and equipment in hardened and/or dispersed facilities.
- l. Protection of agricultural resources and food supplies.
- m. Preparation for the rapid conversion of a large part of the civilian industrial sector to defense production.
- n. Development of large equipped and trained civil defense forces to conduct post-strike damage-limiting and emergency repair and restoration operations in zones of nuclear destruction.

The Soviets also appear to believe that secrecy and concealment will contribute to the survival of the economy. Secrecy is used primarily to deny information to the outside world about enterprises fully or partly engaged in defense production. Such enterprises are usually identified only by post box numbers. The Soviets go to great pains to maintain secrecy about what such enterprises produce and their volume of production. Secrecy is also maintained about the general and specific plans for wartime economic mobilization and conversion of enterprises to defense production. The Soviets try to conceal which enterprises will convert to defense production and what they will be required to produce in wartime. Secrecy is also maintained about the identity of enterprises which are slated for relocation in the event of a threat of war. Furthermore, the Soviets resort to secrecy as well as concealment to hide the locations and any information about fully or partly underground enterprises and standby facilities for relocated enterprises, as well as stockpiles and reserves. The Soviets apparently expect, or at least hope, that the enemy will be unable to identify in advance all enterprises which will be engaged in defense production in wartime, and will fail to locate important enterprises which the

Soviets are at pains to protect and conceal.

Given Soviet secrecy, it is difficult to ascertain the actual extent to which the various measures for the protection of the economy have been implemented. There are indications from various sources, however, that to one extent or another all the measures have been carried out, or will be carried out in an emergency.

a. Hardened Underground Enterprises. The hardening of enterprises has been mentioned in Soviet publications for nearly two decades. Since Soviet publications recognize the impracticability of effective hardening of structures above ground against the prompt effects of nuclear detonations, hardened enterprises are primarily those located underground. Such a form of hardening is costly and can be used only very selectively, especially when an attempt is made to harden an entire enterprise. Consequently, it is likely to be used only for very important and sensitive defense enterprises whose survival is of special interest.

According to Sokolovskiy, "from the viewpoint of anti-nuclear defense it would be best to locate especially important industrial enterprises underground in spaces prepared for this purpose in advance."²⁵² Various Soviet publications also mention the importance of fully or partly hardened underground enterprises.²⁵³ For example, a manual devoted to the problem of protection of machine-building enterprises notes that in planning of new enterprises and during the reconstruction of older ones, measures should be taken to increase the wartime viability of the enterprises, including the "location of the more important elements /of the enterprise/ in underground structures."²⁵⁴ Another publication points out that the most important elements of machine-building plants are the casting, forging-pressing, stamping, mechanical and thermal shops and the electric power system.

²⁵² Sokolovskiy, Voennaya Strategiya, p. 389.

²⁵³ Egorov et al., Grazhdanskaya Oborona, p. 165; Zimin, Razvitie Protivovozdushnoi Oborony, p. 113; Titov et al., Grazhdanskaya Oborona, p. 103; Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 20.

²⁵⁴ Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 20.

They include valuable equipment which is serviced by the most highly skilled production personnel. If this most important equipment can be preserved, then it will be possible to restore production in a short time.²⁵⁵

As far as can be determined, fully underground enterprises are located in tunnel systems dug into mountains, hillsides or bluffs above rivers, or consist of a system of separate-standing shelters. Use also may be made of mines and quarries. Underground enterprises appear to have their own hardened electric power plants, water and fuel supplies and stocks of raw materials, and are probably made as self-contained as possible. Fully underground enterprises and power plants are probably hardened to withstand several hundred psi of blast overpressure.

Partially underground enterprises appear to be built as one or more underground stories under existing production buildings, as detached shelter systems adjoining the above-ground installation, or at satellite enterprises located at various distances from the parent enterprise. The construction of production spaces in basements under existing production buildings has been necessitated in part by plant expansion programs where insufficient above-ground space was available for such expansion.²⁵⁶ Even so, these spaces can be made into hardened production facilities, especially at enterprises which will remain in operation in wartime.²⁵⁷

The hardnesses of basement production spaces varies, depending in part on the weight of the floor above them. It will be greatest where these spaces are located under heavy load-bearing floors.²⁵⁸ The underground spaces may consist of single or multiple floors. Soviet manuals suggest that these spaces would be up to 6 meters (18 feet) in height, and have roofs supported by reinforced concrete pillars either 0.5 x 0.5 meter or 1 meter x 1 meter to the side, 6 or 9 meters apart.²⁵⁹ In the case of detached shelters used for

²⁵⁵ Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 77.

²⁵⁶ Ibid., pp. 117-128.

²⁵⁷ Ibid., p. 118.

²⁵⁸ Ibid., pp. 119, 126.

²⁵⁹ Ibid., pp. 119, 122; M. D. Bodanskii, L. M. Gorshkov, V. I. Morozov, and B. S. Rastorguyev, Raschet Konstruktsii Ubezishch (Calculations for Shelter Construction) (Moscow: Stroizdat, 1974), p. 26.

production purposes, a Soviet manual which provides an example of such a facility pictures it as covering an area of 58.5 meters x 15.8 meters, with the outside walls up to 1 meter in thickness and with interior pillars or bearing walls supporting the shelter roof.²⁶⁰ The depth of the shelter below ground surface will vary. Such shelter-production spaces are usually equipped with loading ramps. If interior walls or pillars interfere with the production process, the shelter may be built with a dome-type roof, without interior supports.²⁶¹

The existence of partial hardened underground production spaces at industrial enterprises is apparently quite widespread. Soviet manuals suggest that various industries, notably machine-building and ball-bearing plants, tend to have basements and production facilities in them.²⁶² This also appears to be the case in some electronics, instrumentation, metallurgical, food processing, missile, and other plants, and research institutions working for defense. Various sources indicate that in many cases shops working for defense at enterprises which are otherwise engaged in production for the civilian sector tend to be located in such underground facilities.

As one would expect, Soviet discussions of which enterprises should be fully or partially protected in underground structures are deliberately vague. On the occasions when these discussions are somewhat more specific, they are put in terms of what are purported to be Western plans and concepts. Even so, such discussions may in fact reflect Soviet concepts, priorities and practices. According to them, the types of enterprises and installations which may be located underground include: electric power stations, substations and transformers, chemical plants, precision and medium-machine building plants, as well as various categories of reserved equipment

²⁶⁰ See Goure, Shelters in Soviet War Survival Strategy, p. 14; I. A. Onufriya and A. S. Danilevskii, Spravochnik Inzhenera-Stroitel'ya (Construction Engineer's Handbook) (Moscow: Stroizdat, 1970), cited in JPRS, Translations on USSR Military Affairs, No. 1240, July 14, 1976, pp. 2-3.

²⁶¹ Bodanskii et al., Raschet Konstruktsii Ubezishch, pp. 15-16; Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, pp. 97-98.

²⁶² Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 119.

and supplies.²⁶³ It is suggested that to locate heavy machine building and metallurgical plants underground is impractical.²⁶⁴ No mention is made of types of defense enterprises which need to be protected in underground facilities.

The actual extent of the implementation of the program to harden industrial enterprises is not known. Available source materials suggest, however, that a significant number of enterprises are fully or partly hardened. For example, a limited sample of 45 sources collected and analyzed by the author indicate the possible existence of 28 fully or partly underground enterprises in or near 15 cities. According to the unverified information provided by these sources, there may be 11 fully underground plants in 10 cities. It is possible, therefore, that the actual number of such enterprises and important installations is considerably larger and that they may exist in a large number of localities.

b. Measures to Reduce the Vulnerability of Enterprises to Secondary Damage. Soviet publications and instructions describe a wide range of measures and programs to reduce the vulnerability of enterprises to direct and especially secondary damage from nuclear strikes. They also note that the character of the measures, their magnitude and their utility will depend on the importance of the enterprise or installation, its location in terms of the probable aim point of a nuclear strike, its proximity to other enterprises whose destruction may threaten secondary damage, and the degree of vulnerability of structures and processes to blast and other effects of nuclear weapons.²⁶⁵ The literature suggests that enterprises and installations in cities which are most likely targets for attack must be assumed to risk being exposed to all damage-causing effects of nuclear weapons.²⁶⁶ This would also be the case for what are

²⁶³ Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 14; Zimin, Razvitie Protivovozdushnoi Oborony, p. 113.

²⁶⁴ Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 14.

²⁶⁵ A. Baranov, "Hardness for Installations," Voennye Znaniya, No. 6, June 1970, p. 16; Egorov et al., Grazhdanskaya Oborona, pp. 151-166; Titov et al., Grazhdanskaya Oborona, pp. 103-105; Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiakh, pp. 20-21.

²⁶⁶ Baranov, "Hardness for Installations," p. 16; Egorov et al., Grazhdanskaya Oborona, p. 145.

said to be "important economic regions." Soviet discussions of measures to reduce the vulnerability of enterprises, especially to secondary damage, are not intended to provide effective protection against accurate strikes on them by nuclear weapons. Instead, the proposed measures are intended to provide only "relative" improvements in the survivability of enterprises and important installations to direct and secondary damage.

The reduction of the vulnerability of enterprises and installations to direct and secondary damage from nuclear strikes are called "engineering-technical measures." These measures include: the strengthening of buildings, increasing their resistance to fire, protection of energy sources and power lines as well as of water, steam, fuel and other essential pipes and storage facilities, strengthening tall structures such as smokestacks and chimneys, removal of highly flammable materials and structures, etc. The stated objective is to gain improvements in the survivability of enterprises and installations at the lowest cost and in such a manner that the measures to increase the viability of enterprises and installations are to be incorporated in the construction of new enterprises or in the case of older ones during their renovations and reconstruction.

Prior to any resort to "engineering-technical measures" to improve the viability of enterprises and installations, a careful analysis is made of the relative vulnerability of each of their elements to blast, thermal radiation and fires, prompt and fallout radiation, flooding, secondary explosives, release of toxic gases, etc.²⁶⁷ These surveys are said to be conducted by special technical commissions at each enterprise or installation.

To facilitate the surveys, Soviet civil defense manuals publish hardness tables for various standard industrial structures, installations and elements, and showing the levels of blast overpressures at which they will suffer slight, medium heavy and total damage. In general, the tables indicate that most industrial buildings will be totally destroyed in the ranges of 0.4 to 1.0 kg/cm² (5.6 - 14.2 psi)

²⁶⁷ Egorov et al., Grazhdanskaya Oborona, pp. 152-162; Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, pp. 20-25; S. Zelkovskiy, "An Exercise Was Prepared," Voennye Znaniya, No. 7, July 1971, pp. 14-15; Krutskikh, Uchebno-Metodicheskoe Posobie, pp. 51-52.

blast overpressures.²⁶⁸ On the other hand, underground pipes, mains, cables and reservoirs are described as being destroyed at levels of blast overpressure ranging from 1 kg/cm² to 15 kg/cm² for underground pipes and cables. Enterprises are also classed into five categories according to their susceptibility to thermal radiation and fires.²⁶⁹ For example, those most susceptible to fire in category include: oil refineries, chemical enterprises, artificial fiber plants, distillation enterprises, and enterprises producing synthetic fuels, gas plants, fuel depots, etc. Those least susceptible to fires are said to include cold metal working enterprises and storages of nonflammable materials.²⁷⁰ Thus, according to the manuals, machine-building plants tend to fall into the lower categories of susceptibility to fires.²⁷¹ Of course, the enterprises' vulnerability to fire can be reduced by eliminating wooden structures, and removing storages of flammable materials from proximity to the enterprises' buildings.

The purpose of the survey which should be conducted at every enterprise is to ascertain the blast and fire resistance of the buildings and essential facilities and production processes, and thereby determine whether any essential structures or facilities require additional hardening. It is suggested that additional hardening measures should be considered when buildings housing the most important production processes of an enterprise are less blast resistant than other buildings of the same enterprise, and if such hardening is practical and likely to be cost effective. For example, it is noted that an increase of 0.1 kg/cm² (1.4 psi) in blast resistance of specific structures can significantly reduce the distance from ground zero of a nuclear detonation at which the structure will likely survive.²⁷² In addition, as was noted, the decision whether or not to raise the hardnesses of structures of specific enterprises will be determined by their importance to the war effort and post-strike recovery.

²⁶⁸ Egorov et al., Grazhdanskaya Oborona, p. 154; Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 10; Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 28; Titov et al., Grazhdanskaya Oborona, p. 96.

²⁶⁹ Egorov et al., Grazhdanskaya Oborona, p. 156.

²⁷⁰ Ibid.

²⁷¹ Ibid., p. 159.

²⁷² Ibid., p. 163; Baranov, "Hardness for Installations," p. 16.

Hardening measures for above ground structures can be relatively simple or complex and costly. They include the reinforcing of walls and roofs and of roof supports, using additional reinforced concrete, steel or reinforced concrete beams, props or supports, steel cables, etc., the construction of metal or concrete walls to shield critical portions of structures from blast and heat, reducing the surface of external walls by placing important production processes in one-story buildings or in semi-buried one-story structures, banking earth against the external walls of low buildings, etc.²⁷³ Another approach consists in raising the hardness of portions of buildings, especially where the most essential and valuable machinery and equipment are located, whose destruction would prevent the rapid restoration of production.²⁷⁴

Soviet publications also stress the importance of a variety of other relatively simple selective hardening and protective measures to improve the potential viability of enterprises and facilitate their repair and restoration. These measures include the burying of electric power cables, as well as of water, fuel, gas, steam and other pipes and conduits, the construction of underground water, fuel and chemical reservoirs, pumping stations, electric power generator plants, transformers, gas distribution points, etc.²⁷⁵ For example, the Moscow First State Ballbearing Plant is reported to have built in the course of its reconstruction and modernization, five artesian wells which were tied into the plant's water system, five underground water reservoirs, several underground filtration and pumping stations, a hardened standby electric power substation and compressor station, in addition to replacing wooden structures with concrete structures and removing flammable materials from the plant area, increasing the dispersal of various buildings.²⁷⁶ Similar activities are reported to be taking place

²⁷³ Titov et al., Grazhdanskaya Oborona, p. 103; Krechetnikov and Olovyaniishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 21; Egorov et al., Grazhdanskaya Oborona, pp. 165-167.

²⁷⁴ Titov et al., Grazhdanskaya Oborona, p. 103; Krechetnikov and Olovyaniishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 22.

²⁷⁵ Krutskikh, Uchebno-Metodicheskoe Posobie, p. 14; Egorov et al., Grazhdanskaya Oborona, pp. 169-171; Titov et al., Grazhdanskaya Oborona, p. 104; Krechetnikov and Olovyaniishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 22.

²⁷⁶ Gromov and Krechetnikov, Grazhdanskaya Oborona Promyshlennogo Obekta, pp. 64-69.

at other enterprises in various localities.²⁷⁷ Indeed, removal of flammable materials and structures from the vicinity of enterprises appears to be widespread practice during comprehensive civil defense exercises at industrial installations. Exposed storage facilities for flammable materials are to be shielded by concrete or earth walls.

c. Emergency Hardening of Valuable Machinery and Equipment. Soviet civil defense publications note that industrial machinery and power equipment are often more resistant to blast than the buildings which house them. The machinery and equipment, however, will be vulnerable to damage from falling or flying debris.²⁷⁸ Other equipment or machinery may have little blast resistance, but would be especially critical and valuable and therefore require special protection. It is noted that, while reliable protection of all of the enterprises' machinery and equipment is not practical, the "task is to reduce to a minimum the danger of destruction of and damage to especially valuable equipment, electronic computers, unique grinding, turning, cutting, and gear cutting lathes, forging machines and presses, pumps and other equipment."²⁷⁹

Soviet publications suggest various measures to protect valuable machinery and equipment. One such suggestion is to install heavy and relatively high blast resistant machinery in structures built of light but non-flammable materials. The idea is that while the building may be easily destroyed, their debris are less likely to severely damage the valuable machinery.²⁸⁰ Other recommendations, however, focus on various methods to harden the structure around valuable machinery or shield the machinery from flying debris. In addition to placing valuable machinery and equipment in the most blast and fire resistant sections of the enterprises' buildings,

²⁷⁷ For example, see N. Lugovoi, "The Deputies Are Listening," Voennye Znaniya, No. 11, November 1970, p. 39; Ya. Vozbrannyi, "Mobilizing Force," Voennye Znaniya, No. 1, January 1978, p. 17.

²⁷⁸ Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, pp. 66-78; Egorov et al., Grazhdanskaya Oborona, pp. 167-169; Titov et al., Grazhdanskaya Oborona, p. 104.

²⁷⁹ Egorov et al., Grazhdanskaya Oborona, p. 167. See also Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 21.

²⁸⁰ Titov et al., Grazhdanskaya Oborona, p. 104.

these sections can be further reinforced in peacetime or preparations can be made for their increased hasty strengthening in an emergency, i.e., strengthening walls, roof supports, banking earth against the external walls, etc. Alternatively or in addition, Soviet publications suggest various methods for protecting individual valuable or essential machines and equipment from blast and debris. The design of such protection depends, among other considerations, on whether continuing access to the machines and equipment is required or they can be shut down during the period of maximum threat.²⁸¹ In the first instance, the immediate structure where the machines are located can be reinforced or a protective structure or special chamber of reinforced concrete or of sandbags can be built around them in a manner which allows access to and continuous operations of these machines.²⁸² In the second instance, the machinery or equipment can be packed with sandbags, or it can be completely encased by special prefabricated, reinforced concrete covers or shields.²⁸³

d. Dispersal and Duplication. In his discussion of methods for assuring the viability of industrial installations in the event of a nuclear war, Marshal of the Soviet Union Sokolovskiy asserted that "their survivability must be secured through compulsory dispersion, duplication of production, and anti-nuclear defense measures."²⁸⁴ Sokolovskiy noted, however, that the location of many industrial enterprises predates the nuclear age and consequently has resulted in concentrations of industries which are not easily changed. He wrote, therefore, that "we are speaking primarily of the proper distribution of newly built installations and the partial and gradual dispersion of existing ones."²⁸⁵ Soviet spokesmen and publications have continued to call for the dispersal of

²⁸¹For example, see V. Gunyakov, "With the Participation of Two Shops," Voennye Znaniya, No. 1, January 1971, pp. 16-17.

²⁸²Ibid., p. 16; Egorov et al., Grazhdanskaya Oborona, p. 168.

²⁸³Gunyakov, "With the Participation of Two Shops," p. 17; Egorov et al., Grazhdanskaya Oborona, p. 168; Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 16; Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 22.

²⁸⁴Sokolovskiy, Voennaya Strategiya, p. 389.

²⁸⁵Ibid.

important economic installations or, as the Soviets call it, the "rational distribution of production forces on the territory of the country."²⁸⁶ The Soviets insist that the industrial dispersal program combines economic considerations with defense interests and point out that the Soviet system of economic planning makes it possible to implement the geographic distribution of industry in a highly planned and systematic manner which is impossible for Western economies to effectively duplicate.

The geographic dispersal and distribution of industry includes various measures ranging from urban planning and the placement of industries, to the construction of new enterprises in localities with low industrial density. It also includes the organization of territorial production complexes and economic regions in such a manner as to make them largely capable of functioning in wartime without depending on parts or semi-manufactured goods from other regions.

In the matter of industrial dispersal and city planning, the Soviets have prohibited the construction of new, large enterprises, especially chemical and "engineering plants," in major cities such as Moscow and Leningrad.²⁸⁷ The Soviet government also persists in calling for the "further restriction of the growth of big cities" and of construction of new significant industrial enterprises in them.²⁸⁸ At the same time, some efforts are made to progressively remove from such cities older enterprises which adversely affect the environment.²⁸⁹ New industries in larger cities tend to be built in separate industrial districts or in nearby satellite towns. For example, in the case of Kiev, it was announced that "large enterprises will be built primarily in the suburban zone," while older plants in the city will be modernized and only new service,

²⁸⁶ Egorov et al., Grazhdanskaya Oborona, p. 145; Mal'tsev, KPSS-Organizator Zashchity Sotsialisticheskogo Otechestva, p. 334; Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, pp. 35-36; Altunin, Lyudi i Dela Grazhdanskoi Oborony, pp. 12-13; Volkogonov et al., Voyna i Armiya, pp. 155-156.

²⁸⁷ Egorov et al., Grazhdanskaya Oborona, p. 145; Pravda, February 14, 1971; speech by A. N. Kosygin, Radio Moscow, June 9, 1971.

²⁸⁸ Egorov et al., Grazhdanskaya Oborona, p. 145; Pravda, December 14, 1975, "Main Direction for the Development of the USSR National Economy in 1976-1980," Pravda, March 7, 1976.

²⁸⁹ Promyslov, "Solving Big City Problems," p. 22, Pravda, June 10, 1971.

construction and food industries will be permitted to be built in the city itself.²⁹⁰ Indeed, the main industrial district of Kiev, located across the Dnieper River forms the principal industrial part of the city, and major enterprises have been built in various satellite towns some 20 km or more from the city. Moscow and Leningrad have numerous industrial satellite towns.²⁹¹

It should be noted, however, that the Soviets have had and continue to carry out a program of modernization and expansion of older enterprises in the major cities. This program has resulted in considerable expansion of production capacities and in the volume of output of older enterprises. It has also contributed in many instances to increasing the density of industrial structures, equipment and labor of these older plants remaining in large cities.

Soviet urban development plans call for the establishment of belts of parks and greenery to separate the industrial city districts from the residential areas. These belts are not only intended to improve the quality of life in the residential areas, but also as fire and blast screens between the industrial and residential areas.²⁹²

The Soviets show little interest in the dispersal of industry in terms of reducing the density of structures and installations at individual enterprises or increasing the spacing between enterprises in cities or industrial centers. It is said that under modern conditions, the "decentralized location of all large enterprises" is impractical because such an approach is inefficient from an economic point of view.²⁹³ It is also noted that industrial complexes (uzly) with a total work force of 20-25,000 or more, tend to be concentrated in areas of 10-100 hectares, and only rarely occupy 1,000 or more hectares.²⁹⁴ Industrial centers may include two or three such complexes, and they may be geographically concentrated or dispersed, depending on whether they are built in or near a large populated center or whether each complex is provided with its own residential settlement. Essentially, therefore,

²⁹⁰ Radio Kiev, October 22, 1969.

²⁹¹ For Example, see speech by Politburo member and First Secretary of the Leningrad Oblast Party Committee G. V. Romanov, "Increasing the Efficiency of the Utilization of Fixed Capital," Leningradskaya Pravda, June 9, 1976.

²⁹² Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 53.

²⁹³ Ibid., pp. 48-49.

²⁹⁴ Ibid., p. 50.

economic and practical considerations in the matters of the density of structures of industrial enterprises and in the collocation of enterprises in older industrial centers tend to override civil defense considerations.

This is not the case, however, when it comes to the geographic distribution of industrial enterprises, especially new ones. Indeed, this is the main feature of what the Soviets mean by industrial dispersal. The basic approach is the construction of new enterprises in smaller towns and in new areas with little or no industrial concentrations, especially near newer sources of energy and raw materials. For example, beginning in the mid-1960s Soviet economic plans called for the construction of 60 percent or more of new industrial enterprises "in towns and settlements with a population of up to 100,000 persons."²⁹⁵ As was noted, however, construction of service, construction and food industries in large cities was continued.

Geographic dispersal of industry is said to combine rational economic planning with improvements in prospects for the survivability of the economy. It is justified from an economic point of view on the ground that it allows new industries to take advantage of newly developed energy or raw material sources and of surplus labor in smaller towns, while contributing to limiting congestion and environmental problems in big cities. From a defense point of view, while it is recognized that modern nuclear weapons can strike any point on the territory of belligerent nations, it is asserted that "nevertheless, it is much more difficult to destroy an industrial base which is dispersed over a large territory."²⁹⁶

The enormous size of the territory of our country and its great natural resources contribute to the solution of the task of defense of industry by means of its maximum dispersal. The planned management of the economy in the USSR makes the successful solution of this task possible.²⁹⁷

²⁹⁵ M. G. Pervukhin, "Production Forces, People and Rates," Literaturnaya Gazeta, February 17, 1971. See also Egorov et al., Grazhdanskaya Oborona, p. 145; Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 12; N. Nekrasov, "The Economic Policy of the CPSU and the Distribution of Production Forces," Kommunist, No. 3, February 1972, pp. 69-70; Volkogonov et al., Voina i Armiya, p. 190.

²⁹⁶ Altunin, Lyudi i Dela Grazhdanskoi Oborony, p. 13.

²⁹⁷ Egorov et al., Grazhdanskaya Oborona, p. 145.

The planned character of the economy also assures the duplication of unique industrial enterprises and processes, whose destruction otherwise could have an adverse effect on the ability of the economy to supply the armed forces. Not only must such plants be duplicated, but they should be located in different geographic areas.²⁹⁸

The program of construction of new major enterprises in medium and small towns and in regions with new sources of energy and raw materials, especially in Siberia, Soviet Central Asia, the Urals, the Caucasus and the Volga River region, has been going on for years.²⁹⁹ Particular emphasis in Soviet economic development plans has been on Siberia, where new industrial centers have been built in conjunction with the construction of major hydroelectric power stations, oil and coal fields, and the BAM railroad. Writing in 1971, Minister of Defense, Marshal of the Soviet Union Grechko declared that:

The shift of production forces to the East, bringing them closer to sources of raw materials and fuel, their dispersed location by economic regions, significantly increases the defense capability of the Soviet homeland, and makes our industry less vulnerable in the event of a missile nuclear war being launched by the imperialists.³⁰⁰

During the Ninth Five Year Plan period (1971-1975), about 2,000 major industrial enterprises were put into operation, many of them in new economic centers or regions.³⁰¹ It is claimed that

²⁹⁸ Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 12; Mal'tsev, KPSS-Organizator Zashchity Sotsialisticheskogo Otechestva, p. 335.

²⁹⁹ For example, see N. Nekrasov, The Territorial Organization of Soviet Economy (Moscow: Progress Publishers, 1977), *passim*; Pravda, March 7, 1976; V. I. Chalov, "Some Problems of Party Guidance of the Creation of Territorial-Production Complexes," Voprosy Istorii KPSS, No. 3, March 1979, pp. 43-54; N. Eroshchenko, "Industrial Potential of the Eastern Regions of the USSR: Problems and Prospects," Kommunist Vooruzhennykh Sil, No. 8, April 1976, pp. 40-46.

³⁰⁰ Marshal of the Soviet Union A. Grechko, Na Strazhe Mira i Stroitel'stva Kommunizma (On Guard Over Peace and the Building of Communism) (Moscow: Voenizdat, 1971), p. 38. See also Altunin, Lyudi i Dela Grazhdanskoi Oborony, pp. 12-13.

³⁰¹ Pravda, March 7, 1976.

in that time, "each year saw the creation of twenty new towns and villages."³⁰² Indeed, between 1970 and 1975, 247 new urban centers were built, including 78 new towns and 169 new "urban-type" settlements, most of them in connection with the development of new economic centers.³⁰³

The construction of new industrial centers and economic complexes or regions has resulted in a rapid expansion of their population. For example, Abakan grew from 56,000 in 1959 to 128,000 in 1979 as a result of the construction of the Sayano-Shushenskaya Hydroelectric Power Station. The industrial complex, built on the basis of this power station, includes some 100 industrial enterprises.³⁰⁴ The population of Tol'yatti rose from 72,000 in 1959 to 502,000 in 1979, largely as a result of the construction of a large automobile plant there. The population of Naberizhnye Chelny rose from 16,000 in 1959 to 301,000 in 1979, principally as a result of the recent construction of the Kama Truck Plant. The population of Bratsk has increased from 43,000 in 1959 to 214,000 in 1979 (it was 155,000 in 1970), as a result of the construction of a major hydroelectric power station, aluminum plant and a timber industry complex there. The town of Surgut in the Tyumen oil fields had a population of 6,000 in 1959 and 81,000 in 1978. The new Ust-Ilimsk town and industrial center which in 1970 had 21,000 inhabitants, had 61,000 in 1979 as a result of the construction of a large hydroelectric power station. Because of the development of nearby coal deposits, the city of Achinsk has grown from 50,000 in 1959 to 117,000 in 1979.

Geographic dispersal is also practiced in European Russia, as the example of Tol'yatti shows. For example, according to Politburo member and First Secretary of the Leningrad Oblast Party Committee G. V. Romanov, speaking about the industrial development of the Leningrad oblast:

³⁰² Construction Projects Everywhere (Moscow: Novosti Press Agency Publishing House, 1978), p. 7.

³⁰³ Central Statistical Administration of the USSR Council of Ministers, Narodnoe Khozyaistvo SSSR v 1974 (USSR National Economy in 1974) (Moscow: Statistika, 1975), p. 32.

³⁰⁴ Chalov, "Some Problems of Party Guidance of the Creation of Territorial-Production Complexes," p. 52.

The pattern of territorial distribution of fixed capital has considerably improved. Basically, by commissioning the first section of Leningrad's V. I. Lenin nuclear power station, the Pyatidesyatiletie Komsomola oil refinery in Kirish, the Belkazin biochemical plant, new capacities at the Fosforit association and the Tikhvin /200 km from Leningrad/ works of the Kirovskiy plant association; large-scale industrial centers have been formed in our oblasts like Kirishi /115 km from Leningrad/, Kingisepp /138 km from Leningrad/, Sosnovyi Bor /about 60 km from Leningrad/, Syastry /about 120 km from Leningrad/, Kirovsk /about 30 km from Leningrad/, and Svetogorsk /about 130 km from Leningrad/, which, together with Volkhov /122 km from Leningrad/ and Pikalevo /about 200 km from Leningrad/, determine the comprehensive development of the Leningrad economic region.³⁰⁵

The new, large iron-pellet processing and steel complex at Staryi Oskol (population 103,000 in 1978), is actually located 20 km from that city.³⁰⁶ Power to the enterprise will be provided by the Kursk and Novovoronezh nuclear power stations.

Despite the ongoing program of territorial distribution of new industry, the effect on the overall geographic dispersal of Soviet industry is becoming evident only very slowly. In terms of production capacities and volume of output, the industries in older major industrial centers continue to predominate all the more so because of the ongoing process of their modernization and expansion. There are also indications that, as is reported, "often plans for the distribution of production forces, justified from a statewide point of view, are difficult to implement because ministries find it unprofitable to set up enterprises and complexes in regions which have not been opened up and in small cities."³⁰⁷ Even so, the Soviets appear to believe that the geographic dispersal of location of plants and industrial complexes will, over time, contribute to the survivability of the economy in a nuclear war. Aside from the general process of the geographic dispersal of industry, of particular significance is the dispersal of defense enterprises and those which the Soviets appear to believe especially important for supporting the war effort. In other words, the Soviet geographic

³⁰⁵ Leningradskaya Pravda, June 9, 1976.

³⁰⁶ Construction Projects Everywhere, p. 22.

³⁰⁷ V. Kistanov, sector chief at the USSR Gosplan Council for the Study of Productive Forces, "The Map of Our Economy," Pravda, April 9, 1979.

dispersal program for industry needs to be examined in terms of Soviet defense-economic priorities and also Soviet assumptions about probable U.S. counter-industry strike priorities. Such an analysis may provide a clear indication of the significance of this geographic dispersal program in Soviet war fighting and post-attack recovery strategies

e. Protection of Energy Sources. Of primary importance for the viability of the economy and its capability to operate in war-time and during postwar recovery is assuring the "stability" of energy supply, especially of electric power.³⁰⁸ In addressing this problem, Soviet publications mention two areas, one dealing with the protection of energy sources, the other with assuring energy supply to enterprises, i.e., measures taken by the consumers of energy.

The protection of energy sources, such as large electric power stations, substations and major transmission lines, is recognized as being a difficult problem. It is noted that while power machinery is quite massive and tends to be relatively resistant to blast, it is vulnerable to damage by flying debris. Even so, survivability of the power system is increased by a number of measures.

First is the development of an integrated national electric power grid system. This allows the power system to bypass damaged sections and draw on power from surviving power stations. The current Tenth Five Year Plan will continue work on the creation of a single energy system for the USSR by integrating the power system of Siberia and Central Asia with that of European Russia, and the construction of long distance high-voltage transmission lines with 500 to 1,150 kw capacities.³⁰⁹ Whether the increasing number of large electric power stations and their geographic dispersal is seen as contributing to the survivability of the power system is not clearly indicated in Soviet discussions of this problem. Given the value the Soviets attribute to the geographic dispersal and duplication of industry, it is likely that the same holds true for the dispersal of electric power stations.

The question of hardening of electric power stations and substations in underground installations is mentioned in Soviet

³⁰⁸ Egorov et al., Grazhdanskaya Oborona, pp. 146, 169; Il'yashev, Spetsialnye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 64; Krutskikh, Uchebno-Metodicheskoe Posobie, p. 51.

³⁰⁹ Mal'tsev, KPSS-Organizator Zashchity Sotsialisticheskogo Otechestva, p. 335; Pravda, March 7, 1976.

publications.³¹⁰ Some underground electric power stations exist in the Soviet Union, although they appear to have been built that way primarily for technical reasons (for example, the Savan hydroelectric power station in the Armenian SSR). Mention is made also of plans to build underground electric pump-storage power stations in various localities.³¹¹ In general, however, hardening measures appear to apply to small power stations or substations intended to supply power to individual important enterprises or installations or at most to groups of a few enterprises.

Soviet publications suggest other measures to improve the viability of the electric power system. This includes avoiding the collocation of stations and substations with other likely targets for nuclear strikes. It is suggested that long distance high-voltage transmission lines which supply power to a long chain of towns, cities and important enterprises, avoid passing through or near such potential targets and that some of the key substations and transformer stations serving these cities, towns and enterprises also be located outside the likely zones of nuclear destruction in the event of strike on these targets.³¹² The possibility of selective hardening of long distance high-voltage transmission lines by placing them underground is also mentioned, but it is not made clear whether such lines are built in the Soviet Union.³¹³

Particular attention is paid in Soviet civil defense measures to assuring the electric power supply at enterprises and important installations. One of the principal methods is the provision of electric power to enterprises from "several independent sources of electric power," which are "sufficiently distant from each other to exclude the possibility of their destruction by a single nuclear

³¹⁰ Zimin, Razvitie Protivovozdushnoi Oborony, p. 113; Egorov et al., Grazhdanskaya Oborona, p. 169.

³¹¹ Izvestiya, May 15, 1974.

³¹² Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, pp. 65-66.

³¹³ Zimin, Razvitie Protivovozdushnoi Oborony, p. 113.

detonation."³¹⁴ If an enterprise receives its electric power from a district (rayon) station, it should be provided with power lines coming from two different directions, or should be receiving power from two separate points in the local power grid.³¹⁵ Substations and distribution control points should be sufficiently far apart to prevent their destruction by a single nuclear weapon.³¹⁶ The large enterprises should also have a number of transformer stations, located at some distance from the enterprises and each other.

As was noted, enterprises and installations, especially those which do not have two independent sources of electric power, may be provided with their own standby small power stations, or with standby mobile generators (with 120 kw capacity or greater).³¹⁷ Such stations and generators may be hardened. While such stations may not provide sufficient power to assure the operation of large enterprises as a whole, they will make it possible to continue production processes which cannot be halted or to operate the most critical machinery.³¹⁸ The independent power sources will also facilitate repairs to damaged enterprises. In addition, the power supply should be protected by placing power lines at the enterprises underground, and by installing protected automatic control systems to shut off damaged power lines and guard against sudden overloads, resulting from electromagnetic pulses.³¹⁹

Measures must also be taken to protect the enterprises' supply of gas, and to guard against secondary fires and explosions which may result from the destruction of gas lines. One economic-technical measure which also benefits civil defense is the construction

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Krutskikh, Uchebno-Metodicheskoe Posobie, p. 51; Egorov et al., Grazhdanskaya Oborona, p. 169; Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 22.

315

Egorov et al., Grazhdanskaya Oborona, p. 169.

316

Ibid.; Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 22

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Egorov et al., Grazhdanskaya Oborona, p. 169; Gromov and Krechetnikov, Grazhdanskaya Oborona Promyshlennogo Obekta, p. 15

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Titov et al., Grazhdanskaya Oborona, p. 105

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Egorov et al., Grazhdanskaya Oborona, p. 168.

of underground gas reservoirs or the utilization of underground caves for gas storage. Such developments are reported in a number of major Soviet cities or economic regions.³²⁰

As in the case of electric power supply, it is recommended that the enterprises be provided with underground gas lines from two separate directions. Parallel gas lines should be interconnected and the whole gas supply system of a city, district and enterprise is built on a ring principle, allowing the gas lines to be duplicated and permitting the rapid shutdown of damaged sections. Automatic controls and valves on the gas mains and distribution pipes are said to be installed to shut off damaged sections and assure the continuous supply of gas through the undamaged ones.³²¹ At the enterprises a central control system should be established for the same purpose.³²²

In the matter of assuring the supply of fuel oil to industry, Soviet publications are less specific. Mention is made of the significance of the further development of the oil industry and of the laying of more underground pipelines for the distribution of oil. It is specified that such pipelines are highly resistant to blast overpressures from nuclear detonations.³²³ At the same time, it is noted that "of great significance for increasing the stability of the operation of installations will be their adaptation to be able to operate, using various types of fuel (natural gas, hard coal, fuel oil)."³²⁴

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Ibid, p. 170; Kosygin on Radio Moscow, June 10, 1970, and his report to the 25th CPSU Congress, Pravda, March 2, 1976; Yu. Rogachev on Radio Moscow, June 15, 1974.

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Egorov et al., Grazhdanskaya Oborona, p. 170; M. P. Tsivilev et al., Inzhennye Raboty v Ochage Yadernogo Porazheniya (Engineering Work in the Area of Nuclear Destruction) (Moscow: Voenizdat, 1968), p. 101.

322

Krechetnikov and Olavyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 23.

323

Egorov et al., Grazhdanskaya Oborona, p. 146.

324

Ibid., p. 174; Titov et al., Grazhdanskaya Oborona, p. 105.

f. Emergency Relocation of Enterprises. According to Sokolovskiy, "particular attention should be given to the evacuation of industrial enterprises to the interior of the country at the beginning of a war or when war threatens."³²⁵ Sokolovskiy noted, that in the event that a "real" threat of war arises, it will be possible to evacuate only a "small and the most important part of industrial enterprises," primarily from the regions and places where the enemy's first nuclear strikes are most likely to take place and where extensive destruction is unavoidable."³²⁶ He also warned that large-scale evacuation of industry could "disorganize production and complicate mobilization measures" and that, moreover, the evacuated industries would be subject to enemy strikes at their new locations.³²⁷

During World War II, the Soviet Union carried a massive emergency evacuation and relocation of industrial enterprises to secure areas. For example, in the period of July to November 1941, 1,523 industrial enterprises, including 1,360 large ones, were evacuated from the Western territories of the USSR over long distance to the Ural, Volga, Western Siberia, Eastern Siberia, Kazakhstan and Central Asian regions.³²⁸ As Sokolovskiy noted, however, in modern conditions such a massive evacuation is not practical. While it could contribute to a greater dispersal of industrial enterprises, it would not preclude enemy strikes on the enterprises at their new locations. Furthermore, such massive evacuation requires considerable amounts of time to carry out, possibly more than would be available prior to an attack.

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Sokolovskiy, Voennaya Strategiya, p. 390.

326

Ibid.

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Ibid.

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G.S. Kravchenko, Ekonomika SSSR v Gody Velikoi Otechestvennoi Voyny (The Economy of the USSR During the Years of the Great Fatherland War) (Moscow: Ekonomika, 1970), p. 113; Ya. E. Chadaev, Ekonomika SSSR v Period Velikoi Otechestvennoi Voyny (The Economy of the USSR During the Period of the Great Fatherland War) (Moscow: Mysl', 1965), p. 75.

Soviet publications mention the possibility of emergency relocation of enterprises to "out-of-city zones," i.e., areas outside the potential target cities or anticipated enemy aim points,³²⁹ but do not describe the types of enterprises which may be evacuated or the character of the sites to which they would be moved. As far as can be determined from various sources, plans for emergency relocation apply primarily to specialized enterprises or departments of large enterprises engaged in the production of instruments or components of particular value to defense. This appears to exclude elements of the heavy industry, but includes enterprises producing such items as aviation instruments, missiles and weapon components, electronic equipment, ammunition, and so on. Some, if not all, enterprises slated for emergency relocation are provided with standby hardened (i.e., underground) and concealed production spaces in areas outside the cities in which they are normally located. According to various sources, such facilities may be 30 to 150 km from the potential target cities. Such facilities may have essential machinery already in place, as well as assured power supply and stocks of fuel, raw materials, parts, etc. In such cases, the relocation involves primarily moving the work force, plans and documents and essential instruments to the prepared sites, where production can be promptly resumed. For these purposes, use may also be made of satellite enterprises of large plants which are often located at some distance from the latter, outside the major cities or production centers. Whether all prepared industrial relocation sites are hardened is not certain. It is likely that some are not, and that the authorities hope to assure their survival mainly as a result of the dispersal of evacuated enterprises and the inability of the enemy to rapidly determine the enterprises' new locations.

Soviet publications also mention the possibility, if time permits prior to an attack, of evacuation of valuable machinery and equipment from enterprises, presumably to prepared sites outside the likely target areas. Obviously, this is less reliable in terms of protection of vital elements of the industry, than the evacuation of enterprises to fully-equipped, standby facilities in relocation areas. It is possible and even likely, however, that there are plans for a selective relocation of machinery and equipment along with the enterprises' work force in the event that strategic attacks are preceded by a lengthy period of crisis or lower level armed conflict.

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Egorov et al., Grazhdanskaya Oborona, p. 82.

Given that Soviet plans for emergency relocation of select enterprises are kept secret, it is not possible to ascertain the number of enterprises slated for relocation or the number of prepared sites for them. The maintenance of fully equipped, hardened facilities for relocated enterprises is very costly and wasteful of production capacities in peacetime. Presumably, therefore, only a relatively small number of enterprises have been provided with such facilities. Even so, their number and the role they may play in assuring vital logistic support to the armed forces and in post-attack recovery may make them strategically significant.

g. Readiness for Rapid Shutdown of Enterprises. The DCI study notes that "the Soviets appear to have given greater emphasis to rapid shutdown of equipment" as a measure intended to mitigate secondary damage from the effects of nuclear strikes at enterprises and installations.³³⁰ The procedures provide for either the automatic or manual shutdown of steam, gas and electric power systems at the enterprises. The power stations, gas supply and distribution stations, and water pumping stations will also shutdown. In particular, emphasis is placed on the "assured shutdown of systems, machines and complexes, whose destruction could cause additional damage from the secondary effects of nuclear explosions."³³¹

The shutdown procedures are required to be worked out in advance as a part of the enterprises' civil defense plans. The shutdown will be initiated when an air raid alert is sounded, and its extent will depend on whether production processes can or cannot be brought to a halt. In periods of a "threat of attack" every station and production shop will have special personnel around the clock to implement the shutdown in the event of an alert. Where the production processes cannot be halted in the event of an alert, some responsible operators will remain in place and be provided with individual metal or concrete shelters.

An example of a planning document of a metal working plant published in a Soviet civil defense manual shows the following procedures and times for shutdown operations in the event of an alert:³³²

The assured cessation of work in all shops, departments and sectors. In the foundry, forging and open hearth shops work is reduced to a low regime - 10 minutes.

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DCI, Soviet Civil Defense, p. 10.

331

Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 20.

332

Egorov et al., Grazhdanskaya Oborona, pp. 291-293.

In the shops halting operations, closedown production and technological equipment, protect unique machines and instruments, shut off electricity, gas, steam and fuel lines - 12 minutes.

In shops which partially shut down operations, convert to low level of operation, shut off supply of oxygen, acetyline, mazut, and gas. Duty personnel remain in shelters in the shops - 12 minutes.

In foundry: halt cupola blower, shut off supply of oxygen. All molten metal poured out of annealing furnaces, cupolas and ladles and is covered with earth - 20 minutes.

Operation of aluminum smelting furnace is halted, the molten metal is poured into molds - 20 minutes.

Halt operation of electric annealing furnaces for casting pig iron according to established regime - 20 minutes.

In the pouring section in the trimming department, highly combustible liquids are removed - 15 minutes.

In the forging shop: halt operation of all metal-heating furnaces and the supply of mazut to the furnaces. The mazut supply pipeline is shut off. Furnace loading doors are closed - 10 minutes.

Shut off all fans and supply of air to crucibles and furnaces - 3 minutes.

Put out forging furnaces - 3 minutes.

Halt operation of electric equipment, shut off electric motors - 5 minutes.

Cover all red-hot metal with slag - 15 minutes.

Shut off lighting, leaving only local duty lighting - 10 minutes.

Shut off inlets of water, air and gaslines - 10 minutes

In machine shop: stop all work - 15 minutes

Machines and equipment are stopped, all types of welding halted - 15 minutes.

Shut off electric system and gaslines - 15 minutes.

Cranes are moved to edge of span, cables are raised - 10 minutes.

All the above shutdown operations are to be carried out simultaneously. The sample plan suggests that at most 20 minutes are allowed to implement the shutdown. Similar tables published in 1970 generally provided for less time to carry out the various shutdown measures. Presumably, the change represents more realistic estimates of the time required to implement the shutdown.

h. Protection of Transportation. Soviet military and civil defense spokesman stress the importance of transportation in a nuclear war, as well as the likelihood that it will be an important target for enemy nuclear strikes. Sokolovskiy warned that nuclear strikes should be expected against bridges, tunnels and other "artificial structures," which will be most "difficult to restore."³³³ Additional threats arise to railroad marshalling yards, transshipment points, control systems. Furthermore, the destruction of cities, which in many instances serve as transportation centers, transit or terminal points of rail lines, highways and river transport may severely disrupt transportation. Of special concern, according to Soviet publications, is the viability of Soviet railroads, which at the present time are the main means of freight and passenger transportation.³³⁴

Soviet discussions of methods for assuring the viability of transportation mention a wide variety of measures. It is noted that the viability of lines of transportation depends in a large measure on their density. Improvements in this regard, such as the construction of two-track rail lines in potentially "tight" areas, is one suggested method.³³⁵ In the same category are measures to build rail and highway bypasses, ring or beltways around potential target

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Sokolovskiy, Voennaya Strategiya, p. 394.

³³⁴

Kulaev, "Railroad Transport: Problems and Prospects," p. 16. In 1977, the railroads provided for 3330.9 billion ton/kilometers of freight turnover out of a total of 5632.6 billion ton/kilometers, Central Statistical Administration of the USSR, Narodnoe Khozyaistvo SSSR v 1977 godu (Moscow: Statistika, 1978) p. 305.

³³⁵

Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 14.

cities and other potential targets for nuclear strikes.³³⁶ There are indications that this program has been and continues to be carried out in the case of major Soviet cities. It is also urged that railroad and switching yards, fuel depots, electric substations, repair depots, and dispatcher and control points be established outside the likely zones of destruction in the event of enemy strikes on cities.³³⁷ Assuring the operability of transportation systems also includes the construction of duplicate bridges at key locations.³³⁸ This also appears to be put into practice, at least to some extent. Soviet publications do not make clear what is done about tunnels. Presumably, it is desirable to either build duplicate tunnels at critical points or by-passes around them.

Further measures to assure the viability of transport include the emergency dispersal of locomotives, railroad cars, vehicles and ships. Reserves of locomotives and rolling stock are created. Efforts are made to assure electric power to the electrified rail lines, but if this fails, the electric locomotives will be replaced presumably by reserve steam locomotives. Technical improvements are to be made at loading and unloading points to accelerate the turnabout of cars, and the capacity of freight cars is to be increased. Measures are to be taken to develop capabilities to make use of rail lines with different gauges.³³⁹ Plans are to be drawn up for combined methods of transportation, i.e., using rail lines, automotive and river/sea transport, to assure by-passes around zones of destruction and damaged transportation sections.

Particular attention is given to measures for rapid repair of damaged rail lines, bridges and highways. Stocks of repair material must be prepared in peacetime and positioned in such a manner

³³⁶

Egorov et al., Grazhdanskaya Oborona, pp. 149-150; Il'yashev Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 69.

³³⁷

Il'yashev, Spetsial'nye Voprosy Arkhitekturno-Stroitel'nogo Proektirovaniya, p. 69.

³³⁸

Ibid.; Lieutenant Colonel N. Yanchenko, "Prompted by the Times," Krasnaya Zvezda, November 23, 1974.

³³⁹

Sokolovskiy, Voennaya Strategiya, p. 394.

as to facilitate the rapid repair of the damage.³⁴⁰ It is also recommended that surveys be made of possible sites for the construction of emergency bridges and that the "foundation for frame bridge supports" be already poured at critical sites in peacetime.³⁴¹

As was noted, military railroad troops along with railroad workers will play a major role in the repair of damaged rail lines, roads and bridges.³⁴² These troops have significant capabilities for carrying out such a mission. During World War II, despite inadequate equipment, these troops restored 117,000 km of railway lines, "over 15,000 bridges," and "dozens of tunnels."³⁴³ Currently, these troops actively participate in the construction of the 3,000 km long BAM railroad line in Siberia which includes 32 km of tunnels and dozens of bridges.³⁴⁴ Soviet railroad troops appear to be well equipped and have considerable capabilities as well as experience in the construction of bridges over wide rivers and railroad tracks in poor soil and under difficult conditions.³⁴⁵

Given the vulnerability of rail transport to disruption which can halt the delivery of parts to the main production assembly plants if these come from distant producers, it is considered to be

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Ibid., p. 393; Yanchenko, "Prompted by the Times;" Galitskiy Voennaya Mysl', No. 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 49.

341

Galitskiy, Voennaya Mysl', No 4, April 1968, FPD Translation No. 0052/69, May 27, 1969, p. 49.

342

See Tolstikov, Voennaya Mysl', No. 1, January 1964, translated in FDD-939, August 4, 1965, p. 36; Colonel General A.M. Kryukov, "Railway Soldiers," Soviet Military Review, No. 7, July 1979, pp. 11-14.

343

Kryukov, "Railway Soldiers," p. 12.

344

Ibid., pp. 13-14; Kulaev, "Railroad Transport: Problem Prospects," p. 20.

345

Colonel V. Telov, "Construction of Bridges Across Large Water Obstacles," Tyl i Snabzhenie (Rear and Supplies), No. 5, May 1979, pp. 63-66. See also Colonel M. P. Tsivilev, Colonel A.A. Nikanorov and Colonel B.M. Suslin, Inzhenerno-Spasatel'nye i Neotlozhnye Avariino-Vosstanovitel'nye Raboty v Ochage Yadernogo Porazheniya (Engineering-Rescue and Emergency Repair and Restoration Work in the Zone of Nuclear Destruction) (Moscow: Voenizdat, 1975), pp. 130-138.

more effective to organize cooperative production among enterprises located in the same economic regions. In the event of the disruption of rail transport, such cooperative arrangements will make it possible to deliver essential production by motor transport.³⁴⁶

No doubt, the problem of maintaining transportation systems under conditions of a nuclear war continues to cause concern to Soviet planners. Although the Soviets appear to have developed major repair capabilities and may have large reserves of locomotives and rolling stock, the Soviet transportation system remains, nevertheless, significantly inferior to that of the United States or Western Europe.³⁴⁷ Some Soviet spokesmen suggest that in wartime automotive transport, because of its greater flexibility and lower vulnerability, will increase in importance.

i. Stockpiles and Reserves. As was noted, stockpiles and reserves of food, fuel, machinery, spare parts, strategic raw materials, and repair equipment play an important part in Soviet measures intended to assure the "stability of the economy and essential logistic support" to the armed forces and the population in wartime. Aside from stockpiles maintained by the state, the various ministries, the state supply organizations, and civil defense, the recommended measures also include the maintenance of essential reserves at industrial enterprises to help assure their operations in wartime.

According to Soviet plans for assuring the "stability" of operation of essential enterprises in wartime, measures must be taken to guard against the possible disruption of the supply system as a result of enemy strikes. Essential enterprises, therefore, should maintain their own reserves of fuel, raw materials, semi-manufactured goods, components and parts, as well as spare parts, machinery and instruments, to allow them to function at a minimum for some period of time in the event of the disruption of normal supplies.³⁴⁸ Each enterprise should determine its degree of dependence

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Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 13.

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For example, see Kulaev, "Railroad Transport: Problems Prospects," pp. 16-22; Central Intelligence Agency, Status of Railroads in the USSR, April 1, 1976, GCR CRB76-001, August 1976; I. Pavlovskiy, "Economics and Transportation," Pravda, March 29, 1978.

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Egorov et al., Grazhdanskaya Oborona, p. 174; Titov et al., Grazhdanskaya Oborona, p. 106.

on supplies and parts from distant supplies and its requirements in the light of its plans for wartime production in general and for minimal essential operations under conditions of a cut-off of supplies. These reserves should be "dispersed" in locations where they are unlikely to be destroyed in the event of an attack.³⁴⁹ If possible, they should be stored in hardened facilities.³⁵⁰

In addition, essential enterprises should make plans to deal with the possibility of protracted disruption of the supply system. The enterprises are instructed to study the feasibility of using local raw materials and supplies, as well as to develop capabilities to use various alternate fuels. Cooperative schemes between enterprises in the same localities should be developed, providing for the possible sharing in an emergency of surviving power capacities, equipment and supplies. The enterprises are also told to prepare for the possibility that they may have to produce themselves critical parts and assemblies which they normally obtain from other enterprises.³⁵¹

Because of the unreliability of the Soviet supply and transportation systems, Soviet managers, as a matter of practice, have tended to maintain substantial reserves at the enterprises, as well as capabilities to repair and restore their own machinery and equipment and produce their own spare parts for them. Scrounging for supplies is a major activity of Soviet managers under peacetime conditions. One result is that reserves at enterprises are frequently larger and more varied than the managers care to admit having. Old machinery is often kept for emergency use and because the enterprises know how to repair and maintain them. The extent of actual reserves at enterprises is not known. It is known, however, that despite reserves, cases of disruptions of production at various enterprises do occur as a result of non-delivery of parts, equipment and semi-manufactured goods, or delays in the repair of important machinery and equipment. Presumably, in the event of a severe crisis the state agencies as well as the enterprises will accelerate and expand their efforts to build up and disperse their stockpiles and reserves.

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Egorov et al., Grazhdanskaya Oborona, p. 174.

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Titov et al., Grazhdanskaya Oborona, p. 106.

³⁵¹

Ibid., p. 105; Egorov et al., Grazhdanskaya Oborona, p. 174.

Of course, it is likely that in wartime the central authorities will exercise strict control over the stockpiles and supply allocations. This will also include the reserves of destroyed enterprises and those which cease their operations in wartime. Soviet literature strongly suggests, however, that as far as possible the stockpiles and resupply system should be organized in a manner which would allow economic areas or centers to be self-sufficient at least for some period of time, and especially to be independent as far as possible in wartime, of long distance haulage of supplies and parts.³⁵² It is also likely that in an emergency the armed forces will assist essential defense enterprises in maintaining their operations, including assuring them with critical supplies.

j. Protection of Agricultural Resources. As Soviet civil defense publications point out "the viability of the economy in modern war is impossible without stable agricultural production."³⁵³ Protection of residents in rural areas and of agricultural resources, including food reserves, livestock, crops, as well as water supplies, and fodder from the effects of nuclear, chemical and bacteriological weapons is said to be "an important task of civil defense."³⁵⁴ While destruction of the opponent's food supply is said to be a likely objective in a war, Soviet civil defense literature indicates that the main concern in the protection of rural areas and resources is the threat of radioactive fallout and of bacteriological agents.³⁵⁵

The Soviet civil defense program for the rural areas includes, therefore, measures to protect the population (including urban evacuees) primarily against radioactive fallout and chemical and bacteriological agents and a complex of measures to protect agricultural resources as well as "liquidate" the effects of enemy attack with "weapons of mass destruction." Included in the measures is also the organization of a large equipped and trained rural civil defense force which will implement these measures as well as assist

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Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 13.

³⁵³

Ibid., p. 15.

³⁵⁴

N. I. Akimov and B.G. Il'in, Grazhdanskaya Oborona na Obektakh Sel'skokhozyaistvennogo Proizvodstva (Civil Defense at Installations of Agricultural Production), second edition (Moscow: Kolos, 1977), pp. 14-15.

³⁵⁵

Ibid., pp. 7-8.

urban civil defense forces in post-attack rescue and damage-limiting operations. Like the urban population, the rural population is also subject to compulsory annual instruction in civil defense and conducts a variety of local exercises, at times in conjunction with the urban civil defense formations.³⁵⁶

A detailed analysis of Soviet measures to protect agricultural resources is too large a subject to be included in this report and will be discussed in a separate study. Soviet publications and various other sources indicate that civil defense measures in rural areas are being put into practice. The extent of their implementation and their effectiveness is difficult to assess and will not be attempted in this study. It should be noted, however, that Soviet agriculture is highly mechanized. Its ability to produce during a war or following it will depend in a large measure on the availability of fuel and spare parts for the operation of the mechanized equipment. In this respect, an important civil defense manual for agricultural enterprises, published in 1978 notes the requirement in peacetime to establish at rural enterprises reserves of "independent sources of electric power, essential amounts of fuel and lubrication materials."³⁵⁷ The manual also makes the point that the "main attention should be focused on the creation and preparation of a sufficient quantity of anti-radiation shelters and the accumulation of individual and medical means of protection."³⁵⁸ It asserts that "the greater the reliability of the protection of the population and the smaller the losses among it, the more favorable will be the conditions for the restoration and the stable work of the installation."³⁵⁹ It may also be noteworthy that Soviet civil defense manuals for rural areas deal with such problems as radioactive contamination of crops, feed and fields and methods for agricultural production under conditions of presence in the soil of strontium-90 and other long-lasting radioactive isotopes and for lowering the levels of such contamination.

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For example, see S.P. Bystritskiy, Kompleksnye Obektovye Ucheniya Grazhdanskoi Oborony v Kolkhoze (Sovkhoze) (Complex Installation Civil Defense Exercises at Collective (State) Farms) (Moscow: Voenizdat, 1978), *passim*; Altunin, "The Valuable, the Advanced Put Into Practice," p. 18.

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Akimov and Il'in, Grazhdanskaya Oborona na Obektakh Sel'skokhozyaistvennogo Proizvodstva, p. 161.

358

Ibid.

359

Ibid.

D. SOVIET CAPABILITIES FOR POST-STRIKE AND POSTWAR RECOVERY

Soviet civil defense publications devote a great deal of attention to immediate post-strike economic repair and recovery but little to the problem of postwar recovery. One reason for this appears to be that USSR Civil Defense is only responsible for short-term emergency damage-limiting, repair and restoration operations, while long-term recovery planning is the responsibility of the top leadership. Another reason is that the leadership does not know in advance the extent of the destruction and damage which the Soviet economy may suffer in the course of a nuclear war, and will not be able to assess its capabilities for postwar recovery until the cessation of strikes on the Soviet Union.

1. Soviet Plans and Capabilities for Post-Strike Repair and Restoration of Damage

A basic premise of Soviet civil defense planning is that immediate damage-limiting and repair operations by civil defense forces in the zones of nuclear destruction or CBR contamination can significantly contribute to the reduction of fatalities and damage and to the continuing economic support to the war effort. Consequently, the conduct of post-strike rescue and emergency repair and restoration work, which is known in the Soviet Union by the acronym "SNAVR," is a basic mission of Soviet civil defense. Indeed, the largest part of Soviet civil defense forces are specifically organized, trained and equipped to carry out this mission.

The Soviets anticipate that the rescue and emergency repair activities will have to be carried out under highly complex, difficult and dangerous conditions, including radioactive and chemical contamination, fires and secondary explosions, flooding, collapsing buildings and falling masonry, and also possibly new nuclear strikes.³⁶⁰ The emphasis is on speed and the earliest possible start of SNAVR, in accordance with local conditions in order to reduce human losses among survivors and limit damage. The operations will be conducted by the surviving (evacuated) urban civil defense forces, reinforced by military civil defense units and rural civil defense units from nearby areas. As far as possible, civil defense units of enterprises located in the zone of destruction will conduct SNAVR at their own enterprises. Units working at damaged enterprises may be reinforced by units from destroyed enterprises, as well as by military civil defense units.

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Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 89.

General plans for post-strike rescue and emergency repair operations are prepared in peacetime by the civil defense staff of enterprises, important installations, utilities and services.³⁶¹ Control over SNAVR by the civil defense forces of enterprises and installations is exercised by the district (rayon), city or operational sector defense staffs. The civil defense staffs of the enterprises and installations exercise direct control and supervision over their civil defense forces. The higher staffs, however, not only order the start of SNAVR, but also establish the priorities and define where the main efforts are to be made.³⁶² In addition to the command posts of the enterprises in their assigned areas of dispersal for civil defense forces, there will be established forward command posts to direct and control SNAVR operations. Communications will be assured by radio and field telephones. Operations will be conducted with all available mechanized, motorized and power equipment, belonging to the enterprises, the city and district (rayon).³⁶³

SNAVR operations begin with a reconnaissance of the zone of destruction to ascertain: levels of radiation and/or chemical contamination, extent and location of fires, conditions of access routes, extent of damage, and condition of survivors in shelters. Simultaneously, the main elements of the out-of-city civil defense forces and military civil defense units move to designated assembly areas. Reconnaissance is divided into general reconnaissance to determine the general character of conditions in the zone of destruction, and special reconnaissance, i.e., engineering, radiological, fire, chemical, bacteriological, etc., conducted by special elements or personnel from municipal services, power industry, engineering and technical repair civil defense units organized on the basis of construction and repair organizations, medical and fire

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For example, see Egorov et al., Grazhdanskaya Oborona, pp. 180-181.

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Ibid., p. 189; Krutskikh, Uchebno-Metodicheskoe Posobie, pp. 71-72.

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Egorov et al., Grazhdanskaya Oborona, pp. 185-187; Tsivilev, Nikanorov, Suslin, Inzhenerno-Spasatel'nye Raboty, pp. 47-67; Titov et al., Grazhdanskaya Oborona, p. 120; Krutskikh, Uchebno-Metodicheskoe Posobie, pp. 87-89; Goure, War Survival in Soviet Strategy: USSR Civil Defense, pp. 168-187.

department personnel, etc.³⁶⁴ Reconnaissance will be conducted from the air (aircraft and helicopters), including use of airborne television cameras, aerial photography and airborne radiation measuring instruments. Ground reconnaissance will be conducted in tracked and wheeled vehicles (including the use of tanks and armored personnel carriers) as well as on foot, and also in powerboats along rivers and canals. While all large civil defense formations have reconnaissance units or teams, it would appear that the military civil defense units will play an important role in the initial reconnaissance and area surveys. They will also track the movement of radioactive clouds and provide warnings of radioactive fallout to the population in its path.

The reconnaissance is followed by road clearance or the construction of by-passes around obstacles, to allow the rescue and repair forces to enter the zone of destruction. The extent of penetration of the units will depend on the levels of radiation and the extent of fires. Soviet publications discuss these operations in great detail, up to and including the order of march of the units, the use of equipment, the width of passages to be made through the debris, methods for crossing water obstacles and swamps, emergency repair of damaged bridges and roads and the lifting of heavy equipment into the zones of destruction by helicopter.³⁶⁵ In achieving access to and movement into the zones of destruction advantage will be taken of the wide avenues and strips of parks and greenery. It is asserted that the work on the clearing and securing of access routes should be completed in four to six hours after the nuclear detonation.³⁶⁶

Once on the spot, the units will conduct a combination of rescue operations of people in shelters and survivors in buildings, local fire fighting, and emergency repairs on power lines, water and gas mains and leaking chemical and fuel storage facilities. They will also shore up damaged walls along access routes and in the areas where SNAVR activities are conducted, and limited decontamination

³⁶⁴

Egorov et al, Grazhdanskaya Oborona, pp. 194-195 and in 1970 edition, pp. 378-393; Tsivilev, Nikanorov, Suslin, Inzhenerno-Spasatel'nye Raboty, p. 45.

³⁶⁵

N. Dolgin, "Clearing the Route," Voennye Znaniya, No. 2 February 1972, pp. 18-19; Krechetnikov and Olovyanishnikov, Grazhdanskaya Oborona na Mashino-Stroitel'nykh Predpriyatiyakh, p. 93; Tsivilev, Nikanorov, Suslin, Inzhenerno-Spasatel'nye Raboty, pp. 124-144; Krutskikh, Uchebno-Metodicheskoe Posobie, pp. 89-91.

³⁶⁶

Tsivilev, Nikanorov, Suslin, Inzhenerno-Spasatel'nye Raboty, p. 39.

of work areas. In addition, efforts will be made to repair slightly damaged blast shelters and make other surviving shelters ready for use by civil defense personnel in the event of a follow-on nuclear strike.³⁶⁷ Meanwhile, people rescued from the shelters and other survivors will be given first medical aid and evacuated to medical triage posts, or, if uninjured, to radiation-free areas.

The length of stay of the SNAVR workshifts in the zones of destruction will be determined first of all by the levels of radiation present at the work sites. In principle, work will not be undertaken in areas with radiation levels greater than 15r/hour and the personnel will not be exposed to cumulative doses in excess of 30r, although cumulative doses over short time periods of up to 50r are viewed as being acceptable. Work will be conducted in shifts, with the length of time determined by the radiation levels (minimum two to four hours, maximum 12 hours). Continuous monitoring of radiation will be conducted at work sites. Personnel who have finished their shift will be sent to radiation-free areas for decontamination, rest, and if necessary, medical treatment.

The emergency rescue and repair operations will be followed by more extensive decontamination and repairs at the enterprises, utilities and on the utility lines, with the aim of putting the enterprise back in operation as rapidly as possible.³⁶⁸ This process will be aided by the reserves of essential material, spare parts, equipment and machinery which the enterprises are supposed to have and by the other preparatory civil defense measures taken to improve the "stability" of the enterprises' operations.

The effectiveness of Soviet plans and capabilities for conducting post-strike repair and restoration operations in zones of nuclear destruction will depend on many factors and is difficult to predict. There is no doubt that large, trained and equipped civil defense forces exist for this purpose, and that the Soviet civil defense staffs are making efforts to develop various contingency plans for the conduct of SNAVR. The availability of forces and equipment and the speed and efficiency with which they will be able to function is, however, scenario dependent. It is also not possible to predict

³⁶⁷

Egorov et al., Grazhdanskaya Oborona, p. 218.

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For example, see E.P. Mikhno, Vosstanovleniye Razrushennykh Sooruzhenii (Restoration of Damaged Structures) (Moscow: Voenizdat, 1974), pp. 198-261.

whether personnel in the out-of-city areas will obey orders to leave their shelters to conduct such operations. Even so, the DCI report concludes that "Soviet leaders and civil defense planners are probably confident that, through rapid shut down and emergency repairs by the surviving work force, limited production at slightly or moderately damaged sites could be restored soon after an attack."³⁶⁹

2. Soviet Post-Attack Repair, Restoration and Recovery Priorities in the Light of World War II Experience

Soviet experience with repair, restoration and recovery during and following World War II provides some indications of possible Soviet priorities (for a more detailed discussion, see Appendix). Of course, there are likely to be important differences between the extent of destruction and the restoration and recovery problems which the Soviet Union faced in World War II and the conditions arising from a possible nuclear war. Even so, it is noteworthy that by February 1942 Soviet output in nearly every significant industrial category declined by some 70 percent as compared with June 1941, and grain production in 1942 as compared with 1940 declined by 66 percent. In the course of the war, and especially during the first year, both the party-governmental apparatus and the population suffered enormous losses (about one million party members and 10 million overall fatalities), and about 25 percent of the country's population came under German control.

The enormity of the repair, reconstruction and recovery problem which the Soviet Union confronted during and following World War II was due to the fact that while the Germans had only occupied some five percent of Soviet territory, these areas had contained 40 percent of the total population and had accounted for 33 percent of the gross industrial output, 47 percent of the agricultural land, and 55 percent of the length of rail lines of the USSR.³⁷⁰ In particular, these areas had been the country's primary producers of coal (63%), iron ore (71%), pig iron (68%), steel (58%), rolled iron (57%), coking coal (74%), aluminum (60%), cement (52%), sugar (87%), and had also accounted for 42 percent of produced, 38 percent of harvested grain.³⁷¹ Aside from the fact that major

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DCI, Soviet Civil Defense, p. 10.

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N.A. Voznesenskiy, The Economy of the USSR During World War II (Washington, D.C., Public Affairs Press, 1948), p. 94

³⁷¹

Kravchenko, Ekonomika SSSR v Gody Velikoi Otechestvennoi Voyny, pp. 129-130, 140-141.

portions of these territories were denied to the Soviets for several years, they suffered massive damage and destruction, as well as economic losses due to removal of large amounts of machinery, equipment, rolling stock and livestock to Germany. Although some enterprises were evacuated, the major portion remained behind.

According to Soviet claims, 31,800 factories and industrial installations, 61 large electric power stations, 265 blast and open hearth furnaces, 175,000 metal cutting machine tools, 3 million spindles, 2,700 coal cutters, 65,000 km of railroad tracks, 15 500 locomotives, 428,000 railroad cars, 137,000 tractors, 95,000 combines and sawing machines, along with 1,710 towns and cities (including six of the eleven cities with populations over 500,000), and 17,000 villages and rural settlements were destroyed, damaged or looted.³⁷² It is also claimed that half of all urban housing in the occupied areas and one-third of rural housing was destroyed or damaged, leaving about 25 million people homeless. In all, about one-third of the Soviet Union's "national wealth" was lost. In addition, the Soviet Union lost in excess of 20 million of its citizens. Yet, the Soviets succeeded in restoring their GNP to the 1940 level by 1948 and by 1950 substantially exceeded the prewar level in output of producer goods and defense industries.

Soviet reconstruction and recovery was carried out in two phases. The first was initiated in 1942 and was carried out during the war itself, as Soviet forces liberated German-occupied territories. The second phase took place after the end of the war, in particular during the Fourth Five Year Plan (1946-1950). In addition, account must be taken of the fact that the Soviet Union, both in the course and after World War II, received considerable external inputs to the recovery of its economy in the form of allied aid, requisitioned enemy resources and reparations.

During the war the repair and restoration program in the liberated areas was led by the State Planning Commission (Gosplan) and specifically a special Directorate of Economic Reconstruction in the Liberated Regions, established by the Commission. The Directorate inventoried surviving assets and determined the extent of the

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Ibid., pp. 124, 144; Voznesenskiy, The Economy of the USSR During World War II, pp. 95-96; Army General S.K. Kurkotkin, chief editor, Tyl Sovetskikh Vooruzhennykh Sil v Velikoi Otechestvennoi Voine 1941-1945 (The Rear of the Soviet Armed Forces During the Great Fatherland War) (Moscow: Voenizdat, 1977), p. 522.

damage, set priorities for the use of resources and for repairs, etc. The Soviet government devoted increasing resources to this program. In 1943 reconstruction absorbed 16.3 percent of total Soviet capital investment and in 1944 its share rose to 41.6 percent.

While the fighting was still going on, Soviet reconstruction and recovery priorities in the liberated areas were determined by the need to sustain the war effort. The Soviet program, therefore, focused on the early recovery of defense enterprises and of heavy industries which could contribute to war production. Specifically, the effort was focused on the repair and restoration of the railroads, electric power, coal and iron ore mining, metallurgy, and defense enterprises. To a lesser extent the efforts also involved restoration of agricultural production to feed the armed forces and liberated population. Restoration of basic industries and war production in the liberated areas helped not only to increase Soviet war fighting capabilities, but also to ease the requirements for long distance transportation of materials and finished goods from Central and Eastern territories.

The Soviets began in 1942 with the recovery of the Moscow coal producing region (Mosbass) which had been briefly occupied by the Germans. Using evacuated Ukrainian coal miners, Moscow subway construction workers and machinery improvised by Moscow's machine-building enterprises, the prewar volume of coal output was reached in eight months of reconstruction efforts, and production more than doubled in 1944.

The main reconstruction effort, however, began only in 1943, with the victory of Stalingrad and the beginning of the liberation of the Ukraine. In the latter also, the main effort was on the restoration of the severely damaged coal industry (Donbass). At the end of the first eight months of 1943, these mines began to produce 22,360 tons of coal per day. In 1944, 106 major mines were back in operation, and by the end of the war 123 major mines, producing 38.5 percent of the Donbass' prewar volume of coal.

Industrial repair and reconstruction of damaged plants also proceeded fairly rapidly despite shortages of manpower and of machinery due to the near total involvement of industry in defense production. Even so, two blast furnaces and 27 open hearth furnaces were put back into operation in the first eight months of 1943. By the end of 1944, 11 blast furnaces, 45 open hearth furnaces, 22 rolling mills, 9 coke ovens, and some 6,000 major enterprises had resumed operation. Reopened aircraft plants produced 26 percent of their 1940 volume. In addition, electric power stations with a capacity of 1 million kw were functioning. By that time most of

the railroad tracks in the liberated areas had been repaired and restored, including some 15,000 bridges.

Overall, at war's end some 7,500 plants had resumed operation in the liberated areas.³⁷³ By that time these areas produced, as compared with 1940 levels, 20 percent of the iron ore, 41 percent of coal, 20.5 percent of pig iron, 15.5 percent of steel, 16 percent of rolled iron, 20 percent of coking coal, and 30 percent of electric power.³⁷⁴ Overall, the gross value of industrial output in the liberated areas at the end of the war was about one-third of the prewar level.

Restoration of agriculture focused on the reconstruction of destroyed tractor plants, machine-tractor stations and agricultural machinery repair shops. Between 1943 and 1945, Soviet industry produced 11,945 tractors.³⁷⁵ About 43 percent of the prewar tractor park in the German-occupied areas, however, was recovered in the course of their liberation. Despite enormous difficulties, by war's end the agricultural output of the liberated areas reached 51 percent of the prewar level. It is noteworthy that despite serious food shortages in the country (in 1942 grain production was 34 percent of 1940 output), the Soviet authorities nevertheless reconstituted by the end of the war the 1941 war grain reserves of some six million metric tons.³⁷⁶

The wartime and immediate postwar external economic inputs made a significant contribution to Soviet economic recovery. The depreciated postwar value of U.S. Lend-Lease supplied of machinery and non-military equipment and materials which remained in Soviet possession after the war was estimated by the U.S. government at \$2.6 billion. In addition, \$300 million worth of such supplies was delivered in 1945-1946. U.S. aid had included machine tools, rail-

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P.N. Pospelov, chief editor, Istoriya Velikoi Otechestvennoi Voiny Sovetskogo Soyuza 1941-1945 (History of the Great Fatherland War of the Soviet Union), Vol. 6 (Moscow: Institute for the Study of Marxism-Leninism, 1965), p. 352.

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Kravchenko, Ekonomika SSSR v Gody Velikoi Otechestvennoi Voiny pp. 239, 242, 253.

375

Ibid., pp. 142, 249-250.

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G. Sorokin, "The Great Economic Victory of the USSR in the War Against Fascist Germany," Voprosy Ekonomiki (Question of Economics), No. 5, May 1975, p. 4.

road tracks and rolling stock (12,300 km of tracks, 1,960 locomotives, 13,041 freight cars, 401,400 trucks, power generating equipment, auxiliary steelmaking equipment, several oil refineries, a tire plant, etc.

Economic inputs through requisition, dismantling and reparations from former enemy states were very large. First of all, beginning in 1944, when the Soviet armed forces moved beyond Soviet territory, they subsisted mainly or entirely on the basis of the local resources, seized as "war trophies" or obtained as "theater procurement." Included was food, fodder, fuel, transportation, etc.³⁷⁷ Along with this the Soviets seized some 35,000 tractors, 7 million heads of livestock, 6,000 km of railroad tracks, some 100,000 trucks and cars, etc. For example, it is claimed that during the 1944 summer-fall campaigns in Romania, Bulgaria and Hungary, Soviet troops captured some 2,000 locomotives and 56,000 railroad cars.³⁷⁸ Large amounts of household goods were also shipped to the Soviet Union.

The Soviets also undertook a massive program of dismantling of German fixed installations, which were shipped to the Soviet Union.³⁷⁹ The value of the removed capital stock has been estimated roughly in the range of \$1.6-2 billion (prewar value). Although a good deal of the equipment was damaged or lost in the process, it did provide the Soviet Union with large amounts of technology and equipment to speed its recovery. According to one Soviet source, in 1944 "acquisitions" accounted for 15.4 percent of total Soviet capital investment, and for 21.8 percent in 1945 and 22.1 percent in 1946.³⁸⁰

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Pospelov, Istoriya Velikoi Otechestvennoi Voiny Sovetskogo Soyuz, Vol. 6, p. 123; Yu. V. Plotnikov and I.N. Chaban, "The Rear of the Soviet Armed Forces During the Years of the Great Fatherland War," Istoriya SSSR, No. 1, 1975, pp. 17-18.

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Plotnikov and Chaban, "The Rear of the Soviet Armed Forces," p. 17.

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See F. Rupp, Die Reparations Leistungen des Sowjetischer Besatzungszone (Reparation Performance of the Soviet Occupied Zone) (Bonn, 1951), passim.

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Cited in R. Moorsteen, Prices and Production of Machinery in the Soviet Union, (Cambridge, Mass., Harvard University Press, 1962), pp. 430-431.

Another external economic input to Soviet recovery came from reparations. Reparations included delivery of industrial machinery and equipment, raw materials and other goods, to the value of some \$7.7 billion. To this was added the conversion of two hundred large German enterprises engaged in reparation orders into joint East German-Soviet "joint stock corporations" valued at \$1 billion. In all, according to German estimates, by 1950 the Soviet Union in one way or another had obtained in excess of \$10 billion in economic inputs.³⁸¹ The Soviet Union also claimed reparations from Finland (over \$300 million), Romania (\$300 million), and Hungary (\$200 million). In addition, the Soviets seized and dismantled some industrial enterprises in those countries. Finally, the Soviets dismantled and removed a large amount of industrial and other economic resources from Manchuria.

Immediately following the war, the Soviet Union received an additional \$200 million in economic aid from the U.S., as well as \$250 million in aid from UNRRA (1945-1947).

In 1945 the Soviet Union's overall gross industrial input was 91.6 percent of the prewar level. In many important categories, however, such as pig iron, steel, rolled iron, oil and in agricultural production, output was significantly below prewar levels (from 59 percent of the 1940 output for pig iron to 65 percent for rolled iron).³⁸² Furthermore, as a result of conversion from war to peacetime production, the gross output declined in 1946 to 77 percent in 1940.³⁸³ In addition, the Soviet Union that year suffered from the worst drought in fifty years. Nevertheless, the Fourth Five Year Plan launched in 1946 appeared quite ambitious. It assigned first priority to producer industries (group A) and railroad transportation. In addition, it called for the expansion of agriculture and of consumer goods production and for the "further growth of the defense capabilities of the USSR." Particular

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See Rupp, Die Reparations Leistungen des Sowjetischer Besatzungszone.

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Chadaev, Ekonomika SSSR v Period Velikoi Otechestvennoi Voiny, p. 208.

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G. Kosyachenko, "The Creation of the USSR War Economy," Planovoye Khozyaistvo, No. 5, May 1975, p. 59.

attention was to be paid to the reconstruction of the devastated territories, where production was to exceed prewar levels. Overall, according to the plan, gross industrial output was to exceed the 1940 level by 48 percent and gross agricultural output by 27 percent.³⁸⁴

The allocation of investments clearly reflected the priorities established in the plan. In effect, 43.2 percent went to the producer industry, 14.2 percent to transportation and communications, and 12.6 percent to housing, while the consumer industries received only 6 percent and agriculture (exclusive of collective farms) 7.2 percent. As a result, the gross industrial output exceeded the 1940 level in 1948 and the producer industries (group A) in 1947. According to Soviet statistics, prewar levels of output were achieved for pig iron in 1949, for steel in 1948, for rolled iron in 1948, for coal in 1947, for electric power in 1946.³⁸⁵ By 1950 gross industrial output exceeded the 1940 level by 73 percent, with producer industries (group A) exceeding that level by 105 percent and consumer industries (group B) by 23 percent.³⁸⁶ Even so, the construction of new capacities for rolled iron, steel, coal and electric power, among others, fell significantly short of the plan's goals. Agriculture continued to lag despite the reconstitution of the tractor park. In 1950 gross agricultural output was 99 percent of the 1940 level and, consequently, well below the plan's goals. The grain harvest that year was 85 percent of the 1940 crop.

The recovery of the areas which had been devastated during the war was facilitated by the various external inputs, the return of evacuated enterprises and of vehicles and tractors requisitioned by the armed forces at the beginning of the war, as well as by the large investments made by the Soviet government. As a result, the

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The plan called for machine building to exceed the 1940 level by 100 percent, electric power by 70 percent, steel by 35 percent, chemicals by 50 percent, coal by 51 percent, aluminum by 100 percent, cement by 80 percent, etc. N.A. Voznesenskiy, Five Year Plan of the USSR, 1946-1950 (London: Soviet News, 1946).

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Chadaev, Ekonomika SSSR v Period Velikoi Otechestvennoi Voiny, pp. 207-208.

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Kosyachenko, "The Creation of the USSR War Economy," p. 59.

recovery of mining, heavy industry and electric power outputs was achieved by 1950. Indeed, the gross industrial output of the Ukraine and Belorussia, the two most industrialized and also most destroyed republics, exceeded their 1940 output by 15 percent by 1950.³⁸⁷ Recovery of the consumer industry, agriculture and housing, however, was slower. The total Soviet agricultural area by 1950 still fell below the prewar level. Wartime rationing of bread, cereals and other foodstuffs for the population was not lifted until 1947. Many foods remained in short supply and there was famine in parts of the country in 1947. The food situation was aggravated by the government's policy to build up state reserves of grain despite shortages. By 1950 these reserves had grown to 27 million tons.³⁸⁸ The reconstruction of housing in the liberated areas, which was begun during the war, was not completed until the second half of the 1950s. Shortages of consumer goods and assortments continued well into the 1960s.

3. Soviet Approaches to the Problem of Post-Nuclear War Recovery

The Soviets do not specifically discuss the problems of post-nuclear war recovery or how they expect to solve them. Obviously, the whole question of postwar recovery is fraught with many uncertainties. Among others, the Soviets cannot be sure about the duration of such a war or reliably predict the extent of human losses and economic damage the Soviet Union is likely to suffer. Nevertheless, the Soviets obviously hope to emerge from the war in a stronger economic position than their adversaries, i.e., with a capability to sustain their population, assure continued Soviet military superiority and to recover more rapidly than the enemy.

In the event that the Soviet economy is subjected to a large-scale attack, it is likely that Soviet priorities for postwar recovery will be very similar to those during and after World War II. Specifically, first priority probably would be given to the recovery of transportation, electric power, fuel, producer industries and defense industries. These industries would be essential for

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Ibid.

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N. Nimitz, Soviet Government Grain Procurements, Dispositions and Stocks, 1940, 1945-1963 (Santa Monica, California: The Rand Corporation, RM-4127-PR, 1964), p. 44.

the preservation of Soviet military power and for the recovery of other sectors of the economy and, as was noted, also are expected by the Soviets to be among the most likely targets for nuclear strikes. Furthermore, these industries on the whole are most difficult to protect from damage or destruction by passive means, and once destroyed, take a long time to rebuild.

In terms of sources for recovery, the Soviets apparently hope to be able to: assure the survival of important elements of the Soviet economy; rapidly repair and restore damaged transportation, enterprises and important facilities with the help of pre-stocked machinery and equipment; and exploit economic resources outside the Soviet Union. The availability of the first two sources will depend largely on the effectiveness of Soviet active and passive defense measures. The availability of the third will depend on the success of Soviet theater campaigns, and the ability to maintain continued control over the bloc and non-bloc countries under Soviet domination. Critical for all three sources will be the functioning of transportation. Of course, given the Soviet assumptions about the character of an all-out nuclear war and strategic targeting, the problem of recovery only arises if, as the Soviets hope, the Soviet Union will survive the war as a nation and system and will be "victorious" in a meaningful sense.

Soviet discussions of the problems entailed in the maintenance of essential production in a nuclear war indicate that at least in the short term recovery will be fraught with major difficulties. As was noted, Soviet spokesmen mention the possibility of severe disruption of transportation, the isolation of economic regions or sub-regions, the destruction of large electric power stations, important producer enterprises, oil refineries, chemical plants, as well as damage to agricultural resources. While stockpiles and reserves may be able to carry the country and its armed forces through the initial phase of the war and facilitate repair and restoration of damaged installations, they are unlikely to suffice to assure a rapid post-attack recovery.

The Soviets appear to be planning for a capability to operate surviving essential industries under conditions of severe disruption of transportation and the supply system. At least in theory, the surviving plants should be capable of using local raw materials to operate on various types of fuel and using local or auxiliary electric power stations, to make their own repairs and produce their own parts, etc. World War II experience has shown the Soviets that with ingenuity some sort of production can be maintained under extremely difficult conditions. During the war, the operations of

the surviving Soviet metallurgical industry had been facilitated by the massive collection and shipments to it of metal scrap by special "trophy" units of the armed forces.³⁸⁹ Extensive use was also made of all sorts of auxiliary enterprises for repairs, including mechanical repair, construction shops, etc., on the collective and state farms. Even so, in the event of the destruction of a high percentage of the fuel, energy and producer industries, whose reconstruction will require long lead-times, it appears likely that programs to achieve rapid rates of recovery will depend to a significant extent on external inputs to the Soviet economy.

In theory, the Soviet Union may have three types of areas or countries which could be exploited for its recovery: member countries of the Warsaw Pact and other communist states allied with the Soviet Union, occupied enemy territories and countries, and states which can be brought into extensive economic cooperation with the Soviet Union by various means, including nuclear blackmail. The first two, however, are likely to suffer extensive damage in the course of the war. Their contribution to Soviet recovery, therefore, is fraught with many uncertainties. Contributions from the third will depend not only on the outcome of the war, but also Soviet ability at war's end to maintain clear superiority in military and especially nuclear power, and a credible capability to threaten their use.

Soviet ability to exploit Eastern Europe for its recovery is facilitated by the economic integration of these countries with the Soviet Union, their membership in the Warsaw Pact, and, in the event of a war, the likely presence of large Soviet forces on their territories. It is claimed that the defense policy of the bloc countries is intended to assure that their "economic potential" be capable of "providing everything necessary for the reliable defense of socialism."³⁹⁰ The economies of the bloc countries as a whole, are expected to be ready to carry out a rapid war mobilization in order to "achieve decisive superiority over the enemy during the war."³⁹¹

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Kurkotkin, Tyl Sovetskikh Vooruzhennykh Sil v Velikoi Otechestvennoi Voine, pp. 377, 379.

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Volkogonov et al., Voina i Armiya, p. 190.

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Ibid.

It is asserted that:

The planning of the intertwining and interrelation of economies on the basis of the principles of socialist internationalism promotes the leveling of economic and cultural development of CEMA countries, while allowing the greatest possible combination of the interests of national economic development with the strengthening of defense capabilities. It is manifested . . . in the possibility of duplicating enterprises having strategic significance so that the incapacitation of some enterprises could be immediately compensated by the introduction of other enterprises.³⁹²

There are also indications that the Soviets regard the entire alliance territory as an area for the dispersal of essential production. For example, it is said that:

In furthering the economic foundations of the defense of the Warsaw Pact countries, particular attention attaches to the joint measures on locating production forces. The correct decentralization of production throughout the entire defense alliance will ensure greater stability of the economy under conditions of modern war.³⁹³

It is very likely, as the Soviet experience during and following World War II indicates, that the Soviet Union will exploit captured enemy territories and resources to sustain its armed forces and for its economic recovery. As was noted in World War II, Soviet forces on enemy territory lived largely off local resources and captured enemy equipment and supplies. Furthermore, the Soviets dismantled and shipped to the Soviet Union great amounts of captured industrial machinery and equipment, means of transportation, livestock and agricultural supplies, etc. In addition, the Soviet Union

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Colonel V. Samoylenko, "Socialist Internationalism and Ensuring the Security of Peoples." Kommunist Vooruzhennykh Sil, No. 17, September 1979, pp. 12-13. See also Grechko, Voorzhennye Sily Sovetskogo Gosudarstva, pp. 427-428.

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Captain I. Maslennikov, "The Economic Foundations of the Collective Defense of the Warsaw Pact Countries," Narodna Armiya (Sofia), January 23, 1974. Emphasis added.

obtained large amounts of economic inputs to its recovery in the guise of long-term reparations from the defeated Axis countries. In possible future land wars, Soviet objectives will include the rapid capture of important strategic and economic regions. It is also suggested that the Soviets will attempt to avoid unnecessary destruction of enemy economic assets which, when captured, may benefit the Soviet Union. For example, it has been said that:

The destructive nature of modern warfare, the difficulty of transporting material means from the depth of a country and the great vulnerability of rear area organs make it necessary to devote serious attention to a study of the possibility for acquiring local resources in theaters of military operations. For this purpose, it is very important to determine which targets and enemy economic regions should be left intact or rapidly reconstructed and used in the interests of strengthening the economic potential of our own country and for supplying the troops. It is also important to determine which, what, where and in what quantity the local resources can be stored and used in the interest of the troops. It is also important to determine what are the conditions for acquiring or using local resources (the presence of electric power and transportation means, manpower resources, transport capabilities, etc.)³⁹⁴

A handbook on the Restoration of Destroyed Structures, published in 1974, notes that it will be necessary to restore destroyed installations "not only on one's own territory, but also in the territory given up by the enemy."³⁹⁵ The book describes not only procedures for repairing and restoring roads, airfields, pipelines, bridges, etc., but also of industrial enterprises.

One can only speculate about what enemy installations in a theater of land warfare, such as Western Europe, the Soviets would either avoid destroying or would seek to rapidly repair and restore. Obviously, while military operations are in progress, the Soviet armed forces will be highly interested in the rapid restoration of captured rail and road communications. In a swift moving Soviet offensive they may also attempt to capture intact important NATO

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Shirokov, Voennaya Mysl', No. 11, November 1966, FPD Translation No. 0730/67, July 27, 1967, p. 60.

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E.P. Mikhno, Vosstanovlenie Razrushennykh Sooruzhenii, p. 5.

storage sites of POL and other vital materials rather than destroy them. In such a war, the Soviets probably would have little incentive to deliberately destroy producer industries (metallurgy, refineries, heavy machine-building, etc.) in Western Europe. These industries would be unlikely to make a significant contribution to NATO's defense in the short-term. At the same time, they would be very valuable to the Soviet Union, both for its recovery in the event of the destruction of such industries in the USSR, and as additional basic industrial capacities if the Soviet industry remains unscathed. Of course, in the event that the theater war becomes protracted, Soviet incentives for attacking and destroying such industries in the theater will most likely increase.

If the Soviet Union "wins" the war and maintains effective military power, it may be able to coerce other countries which are not occupied by Soviet forces to contribute to its recovery. For example, it is conceivable that in a theater war against NATO, Soviet ground operations will be limited essentially to West Germany, Holland and Belgium. If the main NATO forces are defeated there, it may be possible for the Soviet Union to coerce the other Western European countries to collaborate with it in order to avoid destruction. The same could happen in the Middle East, Japan, etc. In other words, if the main elements of the NATO forces are defeated, other countries may see Finlandization as preferable to continued, and probably futile, active resistance. This underscores the importance for the Soviet Union of preserving significant reserves of nuclear weapons and delivery means at war's end and, if necessary, to add to these capabilities from additional production.

From the Soviet viewpoint, the issue is not how rapidly the Soviet Union can fully recover from U.S./NATO retaliatory strikes and achieve a prewar level of production and standard of living for its population. The foremost aim of recovery is to assure that the Soviet Union will be the sole remaining "superpower" in the world and that it can exercise global preeminence and, if possible, dominance. Once recovery has achieved such a position for the Soviet Union, the question of how far ahead of other countries Soviet standards of living should be can be addressed.

III. THE POTENTIAL UTILITY OF SOVIET CIVIL DEFENSE IN CRISIS MANAGEMENT AND ESCALATION CONTROLS

Until now, no country appears to have made deliberate use of civil defense as an instrument of crisis management. In the past, when faced by a possible conventional war, various countries have initiated civil defense measures such as partial urban evacuation, construction of hasty shelters, distribution of gas masks, black-out, etc. These measures, however, were usually only one element of the countries' war preparations such as military mobilization, deployment of the armed forces, and so on. While they did signal to the population the existence of a serious threat of war and the concern of the authorities for its safety, civil defense measures were not perceived as generating significant asymmetries between the countries' war survival capabilities or as affecting the outcome of war.

In the future, because of the enormous human and material losses which may result from nuclear strikes and the threat which the latter pose to national survival, civil defense may come to play a more important role in crisis management. This may be especially the case if major asymmetries exist between Soviet and U.S./NATO war survival capabilities and specifically between the number of casualties each side is believed likely to suffer in a nuclear exchange. Such asymmetries may offer opportunities for Soviet exploitation which could influence the management and outcome of crisis between the opposing systems. In particular, important asymmetries in expected losses and in national survival could influence the resolve of the more vulnerable countries in crisis situations and consequently affect their outcome.

It is also possible that the role and utility of civil defense in crisis management may grow because of its flexibility and capability to incrementally signal to the potential opponent a range of levels of readiness and survival capabilities. At the same time, civil defense measures may appear at least superficially to be less provocative than signals generated by military forces and, therefore, may be believed less likely to precipitate pre-emptive military actions by the other side.

A. SOVIET VIEWS ON THE SIGNIFICANCE AND IMPLICATIONS OF ASYMMETRIES IN U.S./SOVIET CIVIL DEFENSE CAPABILITY

1. Soviet Perceptions of the State and Capabilities of U.S. Civil Defense

Soviet public discussions of the U.S. civil defense program and capabilities are largely propagandistic. They portray the U.S. as having a massive and comprehensive civil defense program which

is suspiciously similar to that of the Soviet Union. This is used to justify the Soviet civil defense program and to defend it against Western complaints about its potential destabilizing effect on the strategic balance. It is also used as a part of Soviet assertions concerning alleged U.S. "war hysteria" and aggressive intentions. At times, the Soviets also appear to be discussing their own civil defense concepts, plans and requirements in the guise of descriptions of alleged foreign passive defense programs. On rarer occasions, however, Soviet descriptions of the state of U.S. civil defense are more realistic.

While Soviet descriptions of the U.S. civil defense organization and its C³ system are generally accurate,³⁹⁶ the discussions of the U.S. civil defense program and capabilities are frequently fanciful. The Soviets often cite long abandoned elements of the program or recommendations which were never implemented as if they were an actual part of current U.S. capabilities.

For propaganda purposes, Soviet spokesmen tend to assert that U.S. views on war survival and civil defense essentially mirror their own. For example, it is claimed that:

In the United States, for example, it is believed that civil defense, along with the armed forces, can make a considerable contribution to a state's survival during war, and that is one of the most important factors determining the national might of the country.³⁹⁷

It is also said that:

American ruling circles consider their primary civil defense task to be that of ensuring the survival of the population and the economy in the event of a nuclear war, that is, the preservation of human and economic resources -- the most important factors determining a country's military strength.³⁹⁸

According to these types of Soviet statements, the U.S. as well as other NATO countries are said to have and continue to develop a comprehensive program for the protection of the population and of the economy against nuclear strikes. It is reported that the U.S.

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Altunin, Sovetskaya Voennaya Entsiklopediya, Vol. 3, p. 25.

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Kotlukov et al., Grazhdanskaya Oborona Vchera i Segodnya, p. 12.

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Goncharov, "U.S. Public Civil Defense Training," p. 98.

has in excess of 200 million marked shelter spaces, although it is not mentioned that these are only fallout shelters and that the U.S. has given up its program to stock them with food and water. The U.S. is said to have a crisis relocation program and a compulsory civil defense instruction program for high school and older students. It is alleged that practice alerts and evacuation exercises continue to be held in U.S. cities. Various claims are also made that the U.S. as well as other NATO countries have extensive programs for hardening and dispersal of industry, for creating large reserves of stand-by electric power, industrial production capacities, machinery, equipment, etc.³⁹⁹ For example, according to Army General I. Pavlovskiy, Chief of Soviet Ground Forces and USSR Deputy Minister of Defense:

In a number of capitalist countries practical steps are being taken to decentralize industrial production throughout the territory of the country in question. In the interests of raising the invulnerability of the economy, the construction of unique producer plants is not allowed and any type of output, particularly if it is of significance for defense, is produced by several enterprises in different parts of the country Large reserves of power producing and industrial capacities, machines, equipment, strategic raw materials, and construction and repair materials are being created for sustaining defense production in the United States.⁴⁰⁰

More serious Soviet treatments of U.S. civil defense, however, acknowledge that much of the plans and measures have not been implemented. For example, according to a 1970 study of Civil Defense in Capitalist Countries:

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For example, see Altunin, Sovetskaya Voennaya Entsiklopediya, Vol. 3, p. 25; Zimin, Razvitie Protivovozdushnoi Oborony, pp. 110-117; Sukhoguzov, "The Problem of Viability of the Economy in Modern War," pp. 10-14; N.D. Ponikarov and V.I. Chumakov, Zaschitnye Sooruzheniya v Podzemnykh Vyrabotkakh (Protective Structures in Underground Mines) (Moscow: Atomizdat, 1973), p. 3; L.I. Korzin, Grazhdanskaya Oborona v Kapitalisticheskikh Stranakh (Civil Defense in Capitalist Countries) (Moscow: Grazhdanskaya Oborona SSSR, 1970), passim.

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Army General I. Pavlovskiy, Planovoe Khzyaistvo, No. 2, January 1973. See also Colonel A. Kol'tsov, "Preparations of the U.S. Economy for War," Voennaya Mysl', No. 12, December 1972, FPD Translation No. 0047/73, November 21, 1973, pp. 95-104.

Despite certain, and at times even significant, achievements in the solution of the separate tasks, the state of civil defense in the leading capitalist countries, as admitted by Western specialists themselves, remains as yet unsatisfactory and is far from corresponding to the level of requirements of a modern missile-nuclear war. In many respects, it does not even assure the solution of tasks under conditions of a conventional war, conducted without the use of nuclear weapons. One of the basic reasons for this is the unpopularity of civil defense among the wide masses of the population.⁴⁰¹

It is pointed out that major elements of the U.S. civil defense program, in particular those dealing with the protection of the economy, remain mainly on paper and "are far from being realized."⁴⁰² Indeed, it is said that concentration of industry and population has continued to grow, making the U.S. more vulnerable to nuclear strikes. Soviet analysts also are well aware of the small amount of U.S. resources devoted in the federal budget to civil defense.⁴⁰³

There is every reason to believe that despite exaggerated Soviet claims about the scope of U.S. civil defense, Soviet analysts are well aware of the low level of U.S. civil defense capabilities. In particular, they can discount any significant U.S. ability to protect what the Soviets consider to be important elements of a war-fighting capability, i.e., defense industries, energy systems, transportation, essential workers, etc.

2. Soviet Views of Potential U.S. Vulnerabilities to Attack

According to Soviet spokesmen, U.S. vulnerability to nuclear attack and the catastrophic effects of such an attack on U.S. national survival arise not only from a lack of an effective active and passive defense capability, but especially from the high degree

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Korzun, Grazhdanskaya Oborona v Kapitalisticheskikh Stranakh, p. 5.

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Korzun, "Problems of Stability of Production," p. 27; Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 14.

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For example, see V.P. Konobeyev and A.A. Poduzov, "Some Economic Effects of the Arms Race in the United States," SShA: Ekonomika Politika, Ideologiya, No. 6, June 1978, p. 5.

of concentration of U.S. population and industry in a relatively small number of regions. For example, it is pointed out that:

The high concentration of industry, which is characteristic of the main capitalist countries, is in obvious contradiction to the requirements of a missile-nuclear war. It results in giving the economic regions the significance of major military-industrial targets of strategic significance, the loss of which would undermine the economic capabilities of the state in wartime.⁴⁰⁴

Soviet spokesmen, therefore, like to claim that the U.S. has failed to carry out a rational distribution of its industry and imply that it would be easier to destroy it than to destroy the Soviet Union's industry.⁴⁰⁵

In the early 1970s, Soviet publications claimed that 50 of the largest U.S. cities contained 42 percent of the total U.S. population, and that 80 percent of the metallurgical industry and 60 percent of the electric power was concentrated in the northeast, the Great Lakes area, with the Los Angeles, San Francisco and Seattle-Tacoma regions constituting the other key industrial centers.⁴⁰⁶

Another U.S. vulnerability which Soviet analysts frequently emphasize is the dependence of the U.S. on overseas sources for various essential raw materials. This dependence, and in particular the long lines of overseas communications on which the U.S. must rely, are vulnerable to disruption.⁴⁰⁷ It is claimed, however,

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Grigor'ev, Ekonomicheskii i Moral'nyi Potensialy v Sovremennoi Voine, p. 76.

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Captain Second Rank V. Yakovlev, "Imperialism - The Enemy of Peoples and Social Progress," Kommunist Voorzhennykh Sil, No. 14, July 1975, p. 70; Sukhoguzov, "The Problem of Viability of the Economy in Modern War." p. 11.

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Grigor'ev, Ekonomicheskii i Moral'nyi Potentially v Sovremennoi Voine, p. 76; Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 11

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Yakovlev, "Imperialism--The Enemy of Peoples and Social Progress," p. 70.

that the U.S. has stockpiles of strategic materials in 200 storage facilities dispersed throughout the country.⁴⁰⁸

Soviet public discussions of possible U.S. human and material losses in the event of a unrestrained nuclear war usually cite U.S. estimates. Presumably, this makes it unnecessary for the Soviets to offer their own estimates and lends greater credibility to the cited numbers. For example, Sokolovskiy, citing a 1965 statement by Secretary of Defense McNamara, wrote that "strikes by Soviet strategic missiles against only 200 U.S. cities could, in a few hours, lead to the destruction of almost 150 million people and two-thirds of the American industrial potential."⁴⁰⁹ Or again, it is said that according to American studies, nuclear strikes on U.S. cities would kill up to 144 million persons, while the availability of radiation shelters could reduce the number of fatalities to 95 million and blast shelters would lower fatalities to 70 million.⁴¹⁰ Using American figures, Soviet commentators also cite the possible death of 10.3 million people, which may result from a nuclear strike against the Whiteman missile complex.⁴¹¹ Various Soviet spokesmen suggest that U.S. loss estimates are on the conservative side and that actual losses would be even larger.⁴¹²

3. Soviet Views on the Influence of a Lack of U.S. War Survival Capability on U.S. Strategic Doctrine, Deterrence and Foreign Policies

The failure of the U.S. to develop a significant war survival capability probably has been a source of happy surprise as well as puzzlement to the Soviets. Obviously, a key U.S. objective is

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Sukhoguzov, "The Problem of Viability of the Economy in Modern War," p. 13.

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Sokolovskiy, Voennaya Strategiya, pp. 237-238. See also Posledstviya Vozmognogo Primeneniya Yadernogo Oruzhiya (Consequences of the Possible Utilization of Nuclear Weapons) (Moscow: Mezhdunarodnye Otnosheniya, 1970) passim.

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Zimin, Razvitie Protivovozdushnoi Oborony, pp. 109-110.

411

Major General R. Simonyan, "The Concept of 'Selective Targeting,'" Kraznaya Zvezda, September 28, 1976, and in "The Pentagon's Strategic Positions and the Security of the Peoples," Mirovaya Ekonomika i Mezhdunarodnye Otnosheniya, No. 11, November 1975, p. 22.

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For example, see Sokolovskiy, Voennaya Strategiya, p. 239.

damage avoidance and national survival. Indeed, the Soviets claim to see the evolution of U.S. strategic doctrine since "massive retaliation" to be a search for options which would allow the U.S. to avoid or limit damage to itself in the event of a nuclear war with the Soviet Union. From a Soviet viewpoint, the U.S. problem of damage limitation appears further compounded by its primary reliance on a retaliatory strategy, although, as was noted, the Soviets do not discount the possibility of a U.S. first counter-force strike.

The Soviet Union obviously has sought to exploit the image of "assured destruction" of the U.S. and to reinforce it, in order to deter U.S. military responses to Soviet challenges, to limit U.S. options and to influence U.S. policy vis-a-vis Moscow. One Soviet line has been to reject all U.S. suggestions to limit possible nuclear conflicts. The Soviets have persistently asserted that the U.S. flexible nuclear strategies and selective targeting concepts are merely intended to facilitate resort to nuclear weapons by the U.S., while limiting or avoiding damage to itself. According to Soviet public claims, such strategies and concepts are unrealistic. The Soviets persistently warn that any U.S. initiation or resort to nuclear weapons, all the more so against Soviet territory, is highly likely, if not certain, to escalate into an all-out nuclear war, which would result in the destruction of the U.S. as well as of its NATO allies. The Soviets also warn that the danger of escalation is inherent in any East-West military confrontation initiated or provoked by the West. The deterrence value of such threats is obvious. The Soviets hope that fear of its own destruction will make the U.S. increasingly reluctant to risk an armed confrontation with the Soviet Union in response to all or most Soviet provocations other than a Soviet attack on the U.S. itself.

The threat of destruction of the U.S. is also used by the Soviets to question and erode the credibility of the U.S. nuclear deterrence strategy. For example, the Soviets assert that the "ruling circles of the imperialist states understand" that any war initiation by them would lead to devastating Soviet retaliation and to such large losses as to result in the collapse of "the entire imperialist system."⁴¹³ As was noted, they also argue that a country cannot rationally, and therefore credibly, threaten nuclear war when it knows in advance that a war would lead to its own destruction.

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Korzun, Grazhdanskaya Oborona v Kapitalisticheskikh Stranakh, P. 7.

The irrationality and lack of credibility of such a threat are reflected both in the fact that it contradicts the primary U.S. objectives of national survival and damage avoidance and that its objective is not a favorable war outcome for the U.S.

Soviet discussions of the utility of civil defense argue, at least by implication, that the lack of such capability in the U.S. weakens the credibility of the U.S. deterrence strategy. For example, they claim that civil defense strengthens Soviet deterrence of aggression by the West.⁴¹⁴ By implication, therefore, the lack of civil defense in the U.S. adversely affects the credibility of U.S. deterrence. Presumably, this is compounded by the great concentration in the U.S. of population and industry in a few strategic regions contrary to reasonable precautions. Furthermore, as the Soviets claim, civil defense and war survival measures in general make an important or even critical contribution to the successful conduct of military operations and the attainment of victory. The lack of such capabilities in the U.S. makes a successful war outcome for it unlikely and, consequently, makes resort to force by the U.S. seem futile. Soviet spokesmen also assert that in the U.S. civil defense serves the purpose of whipping up war hysteria, hostility to the Soviet Union, and facilitates further U.S. military build-up. It could be argued that if the Soviets believe that a civil defense program may have such an effect in the U.S., this lack makes the U.S. appear less dangerous and consequently weakens the credibility of U.S. deterrence in Soviet perceptions.

Since the acquisition of nuclear weapons and strategic delivery systems by the Soviet Union, it has sought to exploit the U.S. fear of a nuclear war, i.e., fear of "unacceptable" damage and losses, to bring about changes in U.S. foreign policy. The Soviets have been asserting all along that the changes in the "correlation of forces," mainly resulting from the Soviet buildup of strategic capabilities, must lead the U.S. to abandon its "from a position of strength" policy towards the Soviet Union and seek "realistic" accommodations with it. As the Soviets claim to see it, U.S. adherence to the principles of "peaceful coexistence" in 1972 is a direct consequence of U.S. recognition of the validity of these Soviet arguments. Thus, it is said that one of the most important factors which led to the

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Milovidov, The Philosophical Heritage of V.I. Lenin, p. 251.

"change in U.S. foreign policy in the early seventies" was the "incredibly increased destructive force of nuclear weapons and the development of the delivery vehicles," which has "put an end to the former invulnerability of the American continent."⁴¹⁵

Even though Soviet public pronouncements continue to ascribe to the U.S. a desire to return to a "position of strength" policy, they also claim that fear of its own destruction precludes the U.S. from advancing its global and regional foreign political and strategic objectives. Soviet spokesmen assert that:

Under present conditions, America's survival as a physical-geographic complex and as a social-economic structure primarily calls for the avoidance of a nuclear catastrophe, which would cause irreparable harm to the American society. For this reason, the avoidance of nuclear war is one of the major goals of American political circles. . . . On this plane, peaceful coexistence is now the "categorical imperative" of American foreign policy from the standpoint of the American bourgeoisie as well.⁴¹⁶

The Soviets would like, of course, to continue to weaken U.S. confidence in its deterrence strategy and limit its utility for U.S. policy. The Soviet line in this respect is to harp on the futility of the U.S. deterrence policy. Not only is it said in response to U.S. efforts to improve the credibility and flexibility of its deterrence that "the policy of threatening nuclear war does not rank among the realities of present-day life,"⁴¹⁷ but it is asserted that:

Many sober-minded politicians and scientists in the West have now become convinced that the arms race and a policy built on so-called "nuclear deterrence" have not only failed to yield the desired results

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V.M. Berezhevskiy, "The Presidential Elections and Detente," SShA: Ekonomika, Politika, Ideologiya, No. 6, June 1976, p. 5.

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"U.S. Long-Term Goals in the International Arena," SShA: Ekonomika, Politika, Ideologiya, No. 9, September 1975, p. 124.

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Observer, "J. Schlesinger's Strange Position," Pravda, July 12, 1975.

for imperialist reaction, but are increasingly complicating the international situation.⁴¹⁸

The Soviets face a particular problem, however, in exploiting their strategic advantages in general, specifically their advantages in strategic defense and war survival capabilities. This problem is how to avoid triggering a stepped-up U.S. effort to close the gaps and neutralizing or denying these advantages to the Soviet Union. The experience of the early 1960s has shown that such attempts can generate a highly undesirable American reaction without necessarily resulting in any gains for the Soviet Union. In recent times, therefore, Soviet public declarations are aimed at denying the existence of a "Soviet threat," or that the Soviet Union seeks strategic superiority over the U.S. The significance of the Soviet active and civil defense programs is played down, with the latter being described as a humanitarian endeavor which in no way can affect the strategic balance. The Soviets obviously seek by means of their declaratory policy, arms control negotiations and so on to restrain U.S. defense programs, while retaining the option of exploiting their advantages at some critical moment in a crisis.

B. SOVIET OPTIONS AND CAPABILITIES FOR EXPLOITING CIVIL DEFENSE MEASURES IN CRISIS MANAGEMENT

The actual stability or fragility of the Soviet-U.S. strategic equation and of mutual deterrence under conditions of "essential strategic equivalence" between the two superpowers has yet to be tested in an international crisis. Should such a crisis occur, especially one which involves a coercive test of strength between the U.S. and USSR, its management and outcome will be largely affected by the mutual perceptions of and images of resolves projected by them. It seems likely that among other factors these perceptions and images would be influenced by any significant asymmetries in relative vulnerabilities and potentials for risk taking. In particular, under conditions of explicit or implicit threat of dangerous crisis escalation, such asymmetries may lend themselves to exploitation by the Soviet Union for the purpose of weakening American national resolves and thereby the credibility and utility of the U.S. deterrence threat. One cannot ignore, therefore, the possibility that in such a crisis the Soviet Union may manipulate and exploit by means of declarations and actions its civil defense capabilities for the purpose of placing the U.S. at a disadvantage and achieving a favorable outcome of the crisis for itself.

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Sh. P. Sanakoev, "Real Preconditions," Pravda, February 24, 1977.

The problem which the Soviet Union would face in managing a major international crisis would be how to combine sufficient pressure on the U.S. (and its allies) to give way and make concessions to Soviet demands while controlling U.S. short and long-term responses so as to keep Soviet risks and costs at acceptable levels. A primary target of Soviet declaratory policy, diplomatic moves and actions would be U.S. national resolve. In particular, this would include Soviet efforts to (a) persuade the U.S. that the potential risks and costs of a confrontation with the Soviet Union greatly exceed the benefits of the specific U.S. objectives, and (b) that the Soviet Union has a rational basis for showing greater resolve and willingness to take risks and for believing that it would incur lower costs in the event of escalation. From the Soviet viewpoint, the weakening of U.S. resolve would affect an important element of the overall balance of forces and thereby alter the "correlation of forces" in favor of the Soviet Union.

Soviet exploitation of asymmetries in war survival and specifically civil defense capabilities in a crisis situation offers a number of possible advantages. First, civil defense is defensive in character and its manipulation may be especially well suited for Soviet attempts to tread the fine line between signalling resolve and greater readiness for possible crisis escalation without provoking or panicking the opponent into drastic and dangerous responses. Second, the prevailing "fatalistic" U.S. official and public image of "assured destruction" of the U.S. in the event of an all-out nuclear war makes the U.S. vulnerable to a test of resolve and to exploitation of images of asymmetries in relative vulnerabilities. Third, the same U.S. image of war outcome makes the U.S. especially sensitive to anticipated asymmetries in human losses. The Soviet ability to claim to hold the U.S. population hostage while denying a similar capability to the U.S. and the possibility that in a nuclear exchange the Soviet Union would suffer far fewer civilian casualties than the U.S. could be used by the Soviets to weaken U.S. resolve while strengthening U.S. perceptions of Soviet resolve and capabilities for risk taking. Fourth, the wide variety of measures encompassed by civil defense and their flexible use make it possible in the course of a crisis to signal and demonstrate various and escalating levels of Soviet resolve and readiness for possible conflict escalation, while increasingly underscoring the asymmetries in U.S.-Soviet damage-limiting and war-survival capabilities.

Below are some possible, but obviously speculative uses the Soviets may make of their civil defense capabilities for crisis management purposes. Obviously, civil defense measures may be taken by themselves in the expectation that the U.S. would detect them, in conjunction with various military moves intended to enhance Soviet military readiness as a precautionary measure or in order to bring greater pressure to bear on the U.S. However, the discussion will not attempt to speculate about what military moves the Soviets might make nor about the potential crisis scenarios themselves.

1. Declaratory Exploitation of Asymmetries in Potential War Survival Capabilities

In a crisis the Soviet Union could limit itself to declaratory exploitation of the asymmetries in U.S.-Soviet war survival capabilities in order to increase U.S. public concern with and awareness of the risks entailed for the U.S. in a possible crisis escalation and thereby weaken U.S. resolve. Such a campaign could be conducted at various levels, but would probably receive the greatest public attention in the U.S. if the appropriate statements were made by top Soviet political or military leaders. Major editorials in Pravda or Izvestiia would also be widely reported in the U.S. The Soviet line could assert that U.S. policy and objectives in the crisis, risk dangerous escalation because the Soviet Union is firmly resolved not to retreat from its position. With this could be coupled an assertion that according to American estimates up to 140 million Americans may be killed if the U.S. provokes a nuclear war, while the Soviet "humanitarian" civil defense program and other defensive measures will assure that Soviet losses would be small. The Soviet line would attempt to cast doubts on U.S. rationality for pursuing a policy which risks such high costs while suggesting that the risk may be tolerable to the Soviet Union and, therefore, that the Soviet Union has a rational basis for its resolve. In effect, this would constitute a Soviet attempt at blackmail of the U.S., based on the asymmetry of respective war survival capabilities coupled with a Soviet exploitation of the U.S. image of "assured destruction" of the U.S. in the event of nuclear war.

The Soviets can be reasonably certain that such statements, especially if they are issued by high placed Soviet spokesmen, will be given wide dissemination by the U.S. mass media and will receive a great deal of attention by the U.S. public and officials. It is also likely that such statements would be given a great deal of credence, certainly insofar as their projection of potential U.S. human losses and damage are concerned. While Soviet claims that the USSR's losses would be tolerable may be questioned, there would be greater uncertainty about them than about projected U.S. losses and consequently also about agreements to the effect that the U.S. should stand pat and call the Soviet bluff. Issued in the midst

of a major crisis, such Soviet declarations may generate a certain amount of panic in the U.S. population as well as growing divisions in public opinion. They could result in substantial voluntary evacuation, reduction in productivity, runs on food, supplies, banks, etc., demonstrations and agitation by various activist groups and frightened citizens, and so on. Of course, the actual effect such declarations may have on U.S. national resolve will depend on many factors, including the national mood and consensus in support of U.S. policy and objectives, degree of public confidence in the government, the effectiveness of its countervailing declaratory policy measures, public and official perceptions of Soviet strength, weaknesses and resolve, and so on.

This particular Soviet move may also have its own cost to the Soviet Union, in that it is likely to alarm the Soviet population. Inevitably it would raise in the minds of the population questions about their potential losses and damage to the Soviet Union. This would be especially the case if, as is likely, Soviet propaganda harps on the danger of escalation of the crisis, even if it assigns sole responsibility for it to the U.S. The Soviet public may not share the optimistic view suggested by the declaration concerning the effectiveness of Soviet civil defense and Soviet damage-limiting capabilities. Of course, the Soviet authorities are likely to be in a better position than their American counterpart in controlling public behavior and public expressions of fear or opposition to policy. Past Soviet crisis experience indicates that Soviet images of leadership resolve and of public support for it can be easily maintained and orchestrated regardless of the private doubts and fears of the citizens.

2. Escalating Soviet Civil Defense Readiness Measures

Soviet civil defense measures lend themselves to overt or concealed implementation and also the non-threatening and threatening demonstrations of Soviet resolve and readiness. Presumably, the concealment of measures would be either precautionary, intended to achieve non-provocative enhancement of the Soviet civil defense posture and readiness to meet a possible U.S. threat or to prevent U.S. countervailing moves during the period of their implementation so as to confront the U.S. with an exploitable higher level of civil defense readiness and capabilities. Exploitation can be achieved by allowing the U.S. to detect the higher state of Soviet civil defense readiness upon its completion or by pointing out its existence and implication in public declarations. The distinction between non-provocative and provocative or threatening civil defense measures would presumably depend on the extent to which the measures appear to enhance Soviet readiness for a first strike and whether they indicate the existence of an immediate or only potential improvement in Soviet war survival capabilities. One could assume

that civil defense measures which do not involve massive population movements or large-scale construction throughout Soviet territory could be more readily concealed or may be more difficult to detect.

In considering the elements of the Soviet civil defense program, there appear to be a variety of measures which could be implemented in an overt or covert manner to enhance Soviet civil defense capabilities without appearing excessively provocative or threatening. For example, such measures could include:

- (a) accelerated preparation of rural areas and small towns to receive, house, feed and shelter urban evacuees;
- (b) initiate shift of enterprises from civilian to defense production;
- (c) accelerate stockpiling of critical supplies and equipment;
- (d) initiate construction of expedient blast shelters at enterprises and important installations;
- (e) dispersal of select reserve equipment and supplies by important enterprises, railroads, etc.;
- (f) construction of expedient blast shelters in cities excluding those where permanent foreign observers (for example, embassies) are located;
- (g) bringing existing shelters to a state of full readiness including stocking them with food and water;
- (h) concealed relocation of enterprises slated to be moved in wartime to concealed, hardened facilities;
- (i) concealed relocation of key leadership elements to out-of-city command-posts;
- (j) construction of expedient blast shelters in all cities;
- (k) concealed dispersal of troops from their normal locations and construction of shelters for military personnel;
- (l) concealed or publicized evacuation of leadership, elite and essential worker elements from cities without permanent foreign observers;
- (m) concealed or publicized limited evacuation of leadership, elite and essential worker elements from all potential target cities.

One should note that none of these possible measures would require public announcements for their implementation. All could be initiated on the basis of secret orders and directives to the affected organizations, personnel and civil defense staffs. For example, the employees of institutions, installations and enterprises could be given their orders to implement their organizations' relocation plans by their chiefs or managers, as is now practiced during exercises, without resort to public announcements.⁴¹⁹ Of course, the Soviet Union would have the option of publicizing any or most of these measures wither at once or in incremental steps to reflect growing Soviet resolve and increasing state of readiness. In such a case, some of these measures are likely to appear more threatening to the U.S. than others. For example, measures (a) through (f) may be relatively non-threatening, while those from (g) through (m) may appear to be progressively more threatening, although they would still fall short of projecting an image of final readiness of USSR civil defense for war. In any event, the Soviets are likely to try to conceal certain measures, such as the relocation of top leadership elements and of select enterprises as well as the extent of mobilization of the industry for defense production.

The Soviets would also have the option of attempting to implement many or all of these measures in the guise and under the cover of civil defense exercises. The holding of these exercises could be made public and would serve to underscore Soviet civil defense capabilities and readiness in order to gain an advantage in the management of the crisis. The Soviets could also not publicize the holding of the exercises themselves until their completion at which time public discussion of the resulting enhancement of Soviet civil defense capabilities could be used for their purpose. Both approaches would have advantages as well as drawbacks. The public announcement of the exercises would guard against U.S. detection of Soviet efforts to enhance their civil defense readiness, and would make them appear to be less provocative. The announcement may nevertheless make the U.S. nervous and provoke U.S. counter-measures. Concealment of the holding of the exercises may avoid the latter if they can be successfully concealed, but would make them appear more threatening if detected and risk provoking an overreaction by the U.S.

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For example, see Colonel A. Zaitsev, "For Those Who Teach: An Important Method of Protection," *Voennye Znaniya*, No. 8, August 1978, p. 28.

3. Urban Evacuation as an Instrument for Crisis Management

The most dramatic and, from the U.S. viewpoint, threatening measure which the Soviets could employ in order to gain leverage in the management of the crisis would be the large-scale evacuation of Soviet cities. Given the high costs of such an evacuation, its disruptive effects on normal activities and economic production, as well as the fears and tensions it would be likely to generate among the Soviet population, resort to it would be an extreme exercise in Soviet brinksmanship and blackmail of the U.S. It is likely that the evacuation would be perceived by the U.S. as an attempt to place the Soviet Union on a war footing. It would raise the question whether having paid the price entailed in the evacuation, the Soviets would not be greatly tempted to take advantage of its successful completion to initiate military operations or even a nuclear strike on the U.S. In any event, such an evacuation would lend to the Soviet Union an image of maximum resolve and readiness for war.

In exploiting this measure for crisis management purposes, the Soviets would have several options. They could announce the immediate initiation of the evacuation at a critical point in the crisis, and exploit the fact of this announcement to gain concessions. Since the implementation of the evacuation takes some time, and at least by implication the strategic balance and the U.S. negotiating position would be adversely affected by its completion, the U.S. would be pressured to make concessions before the evacuation is completed so as to cause it to be called off in order to reestablish a state of mutual vulnerability. Of course, in actual practice the Soviet authorities would have some control over the rate of the evacuation and could stretch out the time for its completion, which would also make this operation less disruptive and possibly also less costly.

Alternatively, the Soviet Union could announce the start of preparatory measures for the evacuation while postponing its initiation for some specific length of time and making this deferment contingent on some specific American concessions. In this case, the Soviets would attempt to use the threat of initiation of the evacuation to gain advantages in the management of the crisis. Presumably, the Soviets would use the time to implement measures which would facilitate a rapid evacuation if this becomes necessary as the next step in the escalation of Soviet civil defense and war readiness measures. Depending on Soviet expectations of the success of this attempted blackmail of the U.S., the preliminary period would be used to prepare the reception areas to receive the evacuees, and possibly also for relocating leadership elements and selected defense enterprises, the initiation of the war mobilization of the economy, call-up of reservists for military service, and so on.

Both approaches would underscore the asymmetry between U.S. and Soviet civil defense capabilities and could be exploited by the Soviet Union to weaken U.S. resolve and generate panic among the American population. Both, however, would not be without risks for the Soviet Union, because Moscow would have to take into account the possibility that they could provoke a U.S. preemptive strike or other significant countermeasures. As was noted, the Soviets do not discount the possibility of the U.S. adopting a preemptive strike strategy, and the Soviets have to be concerned that such threatening Soviet moves could panic the U.S. into initiating such strikes.

In all probability, the sudden initiation of large-scale evacuation of Soviet cities in the midst of a crisis would have the greatest shock effect on the U.S., but it may also be fraught with the greatest risk of provoking a U.S. preemptive attack. The Soviet Union may perceive this risk to be lower if there are indications of significant divisions in U.S. public support for U.S. policies and objectives in the crisis, and signs of growing fear among the American population for its own safety. Soviet threat of initiating the evacuation may be seen as less likely to risk provoking an immediate dangerous U.S. response, because it leaves time for negotiations and moves to prevent its implementation. In any event, it is likely that Soviet assessments of risks in the use of evacuation to gain advantages in the crisis will be influenced by the American domestic situation and attitudes. Under favorable conditions, a situation may arise where a dramatic Soviet move such as the initiation or threat of initiation of urban evacuation could greatly reinforce pressures on the U.S. leadership to make the concessions demanded by Moscow.

4. Civil Defense Measures and the Threat of Limited U.S. Strikes

One possible area in crisis management where the Soviets are likely to exploit asymmetries is potential U.S.-Soviet losses and civil defense capabilities in the possible U.S. threat of resort to limited nuclear strikes on Soviet military targets. Soviet declaratory policy in response to Secretary of Defense Schlesinger's proposal of this option has set the state for the Soviet response as well as outlined its basic content. In effect, Soviet declaratory policy can be expected to focus on two arguments intended to deter the U.S. from resorting to a LNO. These arguments would be (a) that such strikes are likely to cause the escalation of the conflict into an all-out nuclear war, and (b) that even if the exchange remains limited, the U.S. would suffer far greater human losses from it than the Soviet Union. As they have previously done, the Soviets could point to the U.S. studies of the Whitman AFB case in order to point out that Soviet limited retaliatory strikes against U.S. military targets would result in millions of American

civilian fatalities, while the Soviet Union, with its capability to protect its population, would not suffer similar losses. In other words, the Soviets could exploit the asymmetries in the relative vulnerability of the U.S. and the Soviet Union, and insist that because of this asymmetry the U.S. threat is neither rational nor credible, and merely reflects the U.S. government's disregard for the safety of the American people. Statements along these lines by authoritative Soviet sources underscoring U.S. vulnerability, the asymmetry in U.S.-Soviet civil defense capabilities and the lack of credibility of such U.S. deterrence threats could be used to weaken U.S. resolves and the negotiatory position of the U.S. government.

Of course, in a crisis situation, U.S. resolve and negotiatory positions are likely to be more vulnerable to Soviet manipulations of U.S. perceptions of potential risks and losses than to Soviet assertions of capabilities to limit Soviet losses and damage in the event of either a limited or an all-out nuclear exchange. The public discussion of the issue of the asymmetry in war-survival and civil defense capabilities, however, would allow the Soviet to play on these risks and costs to the U.S., while at the same time lending greater rationality and credibility to the Soviet Union's image of resolves and readiness to take risks.

IV. CONCLUSIONS

A persistent theme in Soviet military publications is discussion about the significance of the "revolution" in military affairs, brought about by nuclear weapons and missile delivery systems for them and the implications of this "revolution" for deterrence, war-fighting and war outcomes. One aspect of this "revolution," as the Soviets see it and are concerned about, is the new problem of the vulnerability of the "rear," i.e., homeland, to nuclear strikes and their potential consequences. The Soviets recognize that in principle massive nuclear strikes against an unprotected state can destroy its political, social and economic systems and its capability to wage war, and, as a result, bring about its defeat and collapse. They also point out that nuclear strikes can inflict in a short time such high human losses and damage as to make even successful military operations by one's armed forces meaningless and preclude a favorable war outcome. Finally, the Soviets have been sensitive to the possibility that the new vulnerability of the "rear" could make their opponents' nuclear deterrence threat so credible and effective as to neutralize Soviet military power and deprive it of the political and military utility and of the advantages in peace and war to be derived from the Soviet Union's buildup of its military capabilities.

Because of Soviet belief in the inevitability of continuous and irreconcilable struggle for dominance between the two opposing systems and, consequently, in the persistent danger of war between them, as well as because of a desire to reap political benefits from its massive investment in its military buildup, the Soviet Union has sought to deal with this nuclear predicament. In particular, the Soviet Union has sought to erode, if not neutralize, the U.S. ability to threaten it with "unacceptable damage," as well as to avoid what it sees as the adverse implications for the Soviet Union of a balance of "mutual vulnerability" or "mutual assured destruction." As the Soviets point out, no country can credibly and rationally threaten another with war when both know that it risks its own "assured destruction." Starting with the premise that nuclear weapons are decisive rather than absolute, the Soviet approach to the dilemma has been and continues to be a search for capabilities and strategies which would preserve and reinforce the credibility and utility of Soviet military power for deterrence, foreign policy, as well as war-fighting purposes, and effectively mitigate the nuclear threat to the Soviet "rear."

Consequently, a key objective of Soviet defense preparedness and war strategy is assuring the war survival of the Soviet Union, or better yet, as it has also been described, providing for its unilaterally assured survivability. In specific terms, the attainment of this objective requires capabilities to assure effective

support of the armed forces' operations, the survival of the Soviet system and the CPSU's command and control, and of essential elements of the population and the economy for the successful waging of war. The Soviet Union must be able to emerge from the war with sufficient power to control its defeated enemies as well as deter any potential new challengers, and have the means to assure its rapid recovery so as to ensure its position of global preeminence. In other words, the Soviets believe a nuclear war survival capability to be essential for a credible and effective war-fighting posture and for a rational war winning strategy. As the Soviets see it, such a posture and strategy can provide them with a more reliable way to deter unwanted wars and dangerous confrontations, thereby facilitating a safer and more effective pursuit of Soviet foreign policy objectives. It also improves prospects for a favorable war outcome should deterrence fail. In the Soviets' view, superior war survival or damage-limiting capabilities, and all the more so unilateral ones, can not only have a significant influence on perceptions as well as the reality of the two systems' "correlation of forces," but also have a direct bearing on the balance of forces in the course of a nuclear war and on its outcome.

Of course, civil defense is but one element of a comprehensive Soviet war-fighting and war survival strategy. This strategy combines offensive strategic counterforce strikes, massive active defense and large-scale passive defense. The latter is believed necessary because the active military means are not expected to be able to assure the timely destruction of all enemy strategic weapons before they are launched or reach their targets. While civil defense is likely to be less effective in the event that the enemy succeeds in delivering a massive surprise attack despite Soviet readiness to preempt it, nevertheless it would be expected to mitigate the effects of such an attack and thereby improve the Soviet Union's chances for war survival.

Because of the important contributions made by civil defense to damage limitation and consequently to war-fighting capabilities, system and national survival and postwar recovery, the Soviets regard it as a "component" or "integral" part of their strategic posture and planning. The Soviet civil defense program is of long standing because the Soviet leadership has always been concerned about potential enemy countervalue strikes and the need to mitigate them. It is significant, however, that it has been under military control since the early 1960s and headed by high ranking military men. Furthermore, following the signing of the 1972 ABM Treaty the status of USSR Civil Defense in the Ministry of Defense has been raised by making it a service of the armed forces and its chief a Deputy Minister of Defense, and greater efforts and investments have been and continue to be devoted to upgrading its capabilities and state of readiness.

One significant post-1972 development has been the stated Soviet intention to provide sufficient blast shelter spaces to accommodate the "entire population" in potential target cities and installations. The attainment of this objective, starting from an already large existing shelter inventory, would improve the ability of the Soviet Union to launch surprise counterforce strikes by reducing the need for massive pre-strike urban evacuation which may provide the U.S. with strategic warning. At the same time, the Soviet Union retains the option of evacuating and dispersing its urban population when other political and strategic considerations as well as circumstances make this advisable. Improvements in Soviet capabilities for sheltering-in-place potentially targeted elements of the population also provide the Soviets, as they see it, with greater insurance against the possibility of an enemy nuclear surprise attack.

In assessing Soviet civil defense capabilities, account must be taken of Soviet priorities, especially as they apply to the construction and availability of ready blast shelters. The Soviets do not see a need for a uniform system of protection for the entire country or urban populations. Instead, civil defense priorities are determined in accordance with the value placed on individuals and organizations in terms of their contribution to system survival and the war effort and also in accordance with Soviet estimates of the probability of strikes and their likely magnitude on specific localities and military as well as civilian installations.

In establishing their civil defense priorities in accordance with the degree of potential threat to specific targets, the Soviets appear to be guided primarily by their own strategic targeting doctrine and priorities rather than by the specifics of the U.S. targeting doctrine. Soviet sources suggest two principal reasons for this. One is that, according to Soviet views on the character of a nuclear war and strategic targeting, priority is given to the destruction of targets which have "the greatest influence" on the conduct of the war and attainment of victory. The Soviets not only directly relate their strategic targeting to their war-fighting strategy and objectives, but also give priority to the protection of similar potential targets in the Soviet Union, i.e., those most critical for the survival of their system and the effective waging of war. The other reason appears to be that the Soviets expect the U.S. in the event of a war to adopt a targeting strategy similar to their own, because it is best suited for the rational waging of the nuclear war and the attainment of meaningful war objectives. In other words, the Soviets appear to expect the U.S. to establish strategic targeting priorities in terms of war-fighting requirements rather than punitive objectives. To the extent that U.S. targeting would not be in line with the requirements of effective war-fighting and the pursuit of damage-limiting and war winning objectives, it

is likely to be seen by the Soviets as being of secondary significance and as constituting a potential waste of American strategic assets.

In accordance with Soviet targeting doctrine, priority in Soviet civil defense is given to the protection of the political, governmental and economic command and control system, the political, governmental, managerial, academic and scientific "elite," defense and defense-related industries, including those required to remain in operation in wartime, essential workers, transportation and energy systems, other important elements of the economy needed to sustain the war effort and facilitate recovery, and stockpiles. The Soviet do not appear to expect that the population would be targeted per se, but large elements of it would be at risk because of their proximity to likely enemy targets. Priorities in in-place protection capabilities, i.e., blast shelters, for urban populations is determined by the ranking of the cities in accordance with the extent of the presence in them of high priority targets. The greater the number of such targets and their significance for Soviet system survival and war-fighting capabilities in a city, the higher its priority is likely to be in investments in protective capabilities. The Soviet approach to civil defense priorities in terms of the importance of individuals and organizations and Soviet assessments of probable targets for enemy strikes is also reflected in the establishment of five classes of shelter hardnesses.

For obvious reasons, the Soviets not only assign high priority to protection measures for their political, governmental and economic leadership elements, but implement them with little regard for their assessments of probable enemy targeting priorities. As a result, the non-military command and control system is provided with protection at all levels. Furthermore, it is provided with redundant shelters at places of work, often at the residences of the officials and at out-of-city command posts. One feature of the Soviet wartime command and control system is that the key leadership personnel, at least below national level, will be located in appropriate civil defense staff command posts. Although this may constitute a potential vulnerability, the large number of such shelters, their dispersal and concealment in out-of-city locations and their hardnesses apparently lead the Soviets to expect that command and control will have a high probability of surviving a nuclear attack on the Soviet Union. At the same time the Soviet nomenklatura system is expected to assure the speedy replacement of destroyed leadership elements.

No doubt the most essential factor of the Soviet command and control system will be its capability to communicate, not only within the system, but also to the population. The Soviets are well aware of this and apparently seek to maintain redundant

communication systems. Furthermore, there are indications that military communication facilities may be used temporarily to substitute for destroyed elements of the civilian command and control communication network, just as military commanders may be temporarily substituted for destroyed civilian leadership elements.

As noted, the Soviets also assign priority to the protection of various elite elements, especially so in localities and at installations believed to be likely targets for enemy strikes, as well as to the essential workers of enterprises, utilities and services which will remain in operation in wartime. Priority is also given to the protection of school children and students and to medical personnel at important urban health facilities in potential target areas. The degree of shelter protection provided to the general population appears to be directly related to Soviet views on the probability of particular localities being targeted by the enemy and the value attributed to their population. As a result, there is a differentiated geographic distribution of ready blast shelter capacities. Cities with high priority appear to have large shelter capacities in basement and detached shelters, as well as subways, underground garages and other dual purpose protective structures. Cities with low priorities may have shelters for their leadership and elite elements, school children and students and essential workers, but only limited ready shelter spaces for the general population. Presumably, in an emergency protection of the latter will be accomplished by means of the construction of expedient blast and fallout shelters and evacuation.

There is a possibility, which remains to be verified, that the Soviet authorities have tended to assign greater priority to shelter construction for the protection of the urban population in what could be described as the "white heartland" of the USSR, i.e., the populations of the RSFSR, Ukraine and possibly Belorussia. They appear to show less concern for or are more selective in providing ready protection for the general population in other ethnic regions of the country. The Soviet leadership is not only likely to regard the preservation of this heartland as being critical for the survival of their system and a successful war effort and, therefore, expect it to be the main focus of enemy strikes, but it may also consider higher population losses among the other nationalities to be more acceptable and of lesser significance. If this were to be confirmed, it could indicate that a U.S. threat to inflict high casualties on the more vulnerable non-European Soviet nationalities may not be equated by the Soviet leadership with "unacceptable damage," and may be viewed by it as constituting a possible waste of U.S. strategic assets.

Analysis of the Soviet approach to the problem of preserving the viability of the economy in wartime reveals a number of points of special interest. The first is the importance attributed to the preservation of the economic command and control, including managerial personnel at individual enterprises. Second, the Soviets anticipate the possibility of temporary economic "regionalization" as a result of the disruption of transportation and the destruction of important enterprises or entire economic regions. The Soviets, therefore, call for the regions, centers and complexes to develop capabilities for maintaining independent operations on the basis of locally or regionally available resources. Third, the Soviets continue to stress the dual economic and civil defense advantages to be gained from the geographic dispersal of industry, primarily of new enterprises, and the creation of new economic regions and complexes in locations which previous had little or no industry or which are near new energy sources. Fourth, in terms of greatest Soviet concerns and priorities for protective civil defense measures, their focus is on energy, especially electric power, transportation, defense industries, oil and chemical industries, medium and light machine-building industries and electronic industries. While mining and heavy machine-building are considered important in the event of a protracted war and postwar recovery, they are believed to be less significant for sustaining a relatively short war effort. Furthermore, doubts are expressed about the feasibility of providing effective protection for large metallurgical enterprises. The Soviets, however, do appear to believe that their various measures to protect the other priority enterprises and installations can not only limit damage to them, but assure their continued operations, as well as the rapid repair and restoration of damaged installations.

Of special interest is the importance attributed in Soviet planning to stockpiles, not only of military equipment, but also of food, fuel, raw materials, machinery, spare parts, medical supplies, and so. Soviet discussions indicate that there is considerable uncertainty about the ability of the economy during the most intense phase of a nuclear war to assure effective support of the armed forces and of the population. Furthermore, the Soviets anticipate the possibility of the temporary isolation of economic regions, the disruption of transportation, and a requirement for massive repair of damage and for urgent replacement of destroyed equipment. They believe, therefore, that ready stockpiles and reserves will play a critical role in sustaining military operations, essential economic production and the surviving population. The survival of the stockpiles is assured by a combination of dispersal and hardening of storage sites and facilities.

Soviet plans for post-strike damage-limiting and emergency repair and restoration operations which will be conducted by the civil defense forces, military civil defense troops and possibly supported by other elements of the armed forces, give priority to those installations and facilities which are of particular importance to the war effort. In particular, this applies to power sources and utilities required for continued industrial production, enterprises engaged in defense production and transportation. The Soviets are making efforts to reduce the vulnerability of their rail and highway transportation systems to disruption by enemy nuclear strikes and are developing significant capabilities for rapid repair of damaged lines, roads, bridges, and so on. This activity will be conducted by transportation personnel as well as military railroad and highway construction troops which possess considerable capabilities as well as experience in the construction and repair of transportation lines.

To a considerable degree, the Soviets appear to count on secrecy and concealment to help protect important elements of their war economy from attack. This applies not only to the peacetime use being made for defense production of partial capabilities of many plants primarily engaged in production for the civilian sector and to Soviet plans for the war mobilization of the economy and its conversion to defense production, but even more so to the nature, number and locations of hardened enterprises, reserve power stations and stockpiles, the types and number of enterprises slated for relocation in time of crisis and the locations and hardness of their assigned out-of-city stand-by production facilities, the extent of protection given in enterprises to the most valuable machinery and equipment, and so on. As was noted, secrecy and concealment are also used to protect the locations of the leadership elements and civil defense command posts. The Soviets also attempt to maintain secrecy about the specific crisis relocation sites to which the essential workers of important enterprises and organizations will be moved.

Unlike the U.S. where probable levels of losses and damage which may result in a nuclear war are widely discussed, the Soviets give no authoritative indication of the level of losses and damage they expect the Soviet Union to suffer in accordance with various war scenarios. Indeed, the only scenario the Soviets discuss in any detail is that of a Soviet preemptive first strike on the U.S., executed in accordance with Soviet targeting doctrine. There are indications, however, that the Soviets expect to suffer high levels of material damage in an all-out nuclear war. Soviet authorities also do not give any clear indication of the degree of confidence they may have in the ability of their civil defense measures to reduce losses and limit damage. Some of the publications, however, have asserted that human losses may be kept to some six to eight

percent of the Soviet Union's urban population. Even so, as the continued investments in and efforts to improve the Soviet civil defense program indicate, the Soviets appear to expect that their civil defense preparations will make an important contribution to their war effort and to system and national survival as well as facilitate postwar recovery. Concerning the latter, there are some indications that the Soviets hope to make use in their recovery of surviving Eastern European production capacities as well as of captured or controlled economic resources in Western Europe and elsewhere, if the war outcome is favorable to the Soviet Union.

It may be that the relatively optimistic Soviet outlook on prospects for the Soviet Union's war survival is in part influenced by their expectations that the U.S. would not or could not target the evacuated and dispersed urban population, that the prospects of survival of Soviet shelters is enhanced by the relatively low yields and poor hard-target kill capabilities of present U.S. SLBM warheads, and that the U.S. strike will produce relatively little radioactive fallout. Such expectations appear to be reflected in Soviet plans to provide the rural population and urban evacuees with relatively simple fallout shelters. It is also reflected in Soviet expectations that in most cases the duration of necessary shelter occupancy will be relatively brief, a matter of a few days, rather than weeks, and the fact that the Soviets plan to stock the shelters for the general population with food and water accordingly. Furthermore, Soviet plans for the invitation of rescue, damage-limiting and emergency repair and restoration operations by large contingents of civil defense forces immediately following nuclear strikes appear to reflect an assumption that these forces will not be generally pinned down by fallout and that in many cases the radiation levels in the zone of destruction will not preclude such activities. Along with this, the deployment of large civil defense forces, which would be composed principally of essential workers, in or near these zones suggests a Soviet willingness to expose them to the risk of possible enemy follow-on strikes in the same general target areas. It is possible, therefore, that the Soviets tend to discount the likelihood that the U.S. would invest significant portions of its remaining nuclear assets to restrike the same target.

The Soviets are aware of the lack of an effective civil defense program in the U.S. and of the resulting greater vulnerability of the American population and economy to attack, which they say is further enhanced by the greater concentration of industries and population in a small number of "strategic" regions. They are also well aware of American estimates of probable losses and damage which could result from a Soviet attack on the U.S. They appear to believe that fear of destruction of the U.S. has had a significant or even decisive effect on the evolution of U.S. strategy and

foreign policy and that the lack of an American war survival capability is a factor in the strategic balance and an element of weakness in the credibility of the U.S. deterrence strategy.

Whether or not the Soviet Union can and would exploit the asymmetries in U.S.-Soviet vulnerabilities and war survival capabilities for crisis management purposes cannot be predicted. There is no historic precedent for such an exploitation of civil defense capabilities, but then there is also no precedent for the levels of destruction which nuclear weapons can inflict and the new sensitivity of countries and their populations to the threat of this type of bombardment. In any event, the possibility cannot be discounted that in a major crisis, especially one involving a coercive test of strength between the U.S. and the Soviet Union and a threat of dangerous crisis escalation, that the Soviets would seek to gain an advantage by exploiting its civil defense capabilities and the greater U.S. vulnerabilities to nuclear attack in an attempt to influence and weaken American resolve. The defensive character of civil defense and the possibility of flexible and escalating use of its measures may be especially well suited to this purpose, all the more so as it would be in the Soviet interest to try to preclude American overreactions and dangerous responses. Soviet declaratory policy, therefore, may seek to underscore the "assured destruction" the U.S. risks in failing to make concessions as well as Soviet superior war survival capabilities and the rational basis these provide for a Soviet show of greater resolve and willingness to take risks.

Soviet uses of civil defense measures in support of their declaratory policy could range from preparatory steps which, while enhancing their civil defense capability, would not be seen as immediately resulting in significant reduction of Soviet vulnerabilities to attack, to measures which would do so. Of course, many Soviet measures could also be implemented in a covert manner for precautionary reasons as well as to allow the Soviets to exploit the completion of their implementation to pressure the U.S.

In all probability, however, the most dramatic as well as threatening step would be the massive crisis relocation of the urban population. The Soviets could announce its immediate initiation or could threaten its initiation at some specific future point in time if the U.S. fails to make desired concessions. This move would not only cause great anxiety among the American population and possibly result in considerable disruption of the U.S. economy, but it would raise the question whether the completion of the Soviet crisis relocation would not tempt the Soviet leadership to initiate nuclear aggression. A Soviet decision to undertake such a costly

and potentially high risk blackmail move may hinge on the degree to which the U.S. domestic situation appears in Soviet perceptions to be vulnerable to such a shock treatment.

Given that authoritative Soviet leaders and spokesmen insist that civil defense is an important strategic factor, the Soviets undoubtedly take into account in their assessments of the strategic balance the asymmetry between the Soviet Union and the U.S. in civil defense capabilities. They claim to be guided by Lenin's dictum to the effect that one must prepare for war "seriously or not at all." In their view serious preparations for war fighting require capabilities for assuring the primary objective which is the country's war survival. It is not surprising, therefore, that as Brezhnev has made clear, neither the detente in U.S.-Soviet relations nor SALT will cause the Soviet Union to halt its efforts to continue the improvement of Soviet civil defense capabilities.

Assessments of the effectiveness of Soviet civil defense capabilities are to a significant, but possibly diminishing degree, scenario dependent. In particular, as the Soviets continue to build up their inventories of ready blast shelters, hardened political, governmental and economic C³, protected industrial and other essential economic installations and stockpiles, the dependence of the effectiveness of civil defense measures on substantial early warning may decline. At the same time, continuing improvements in Soviet counterforce and active defense capabilities, and all the more so possible break-outs in these systems, will tend to increase the effectiveness of civil defense. This combination may lead the Soviet leadership to believe that it can assure the war survival of the Soviet Union and the preservation of a superior war fighting capability in the face of U.S. strategic weapons programs for the coming decade.

The materials examined in this study suggest a number of possible implications for U.S. deterrence and defense concerns:

- o Assessments of the Soviet civil defense program and of its capabilities should be made in accordance with Soviet priority systems and value judgments. Generalizations and averaging of capabilities where applied to the USSR as a whole will be misleading and of little value.
- o The primary Soviet concern is with system survival and preservation of an effective war fighting capability. U.S. strikes against targets which do not affect these priorities will likely be viewed by the Soviets as being of secondary significance or possibly even as a waste of U.S. strategic assets.

- o The targeting of Soviet political-governmental-economic C³ as a specific U.S. deterrence threat is likely to have little effect on Soviet perceptions and behavior because the Soviets have all along assumed that their C³ would be targeted and have given first priority to its protection.
- o It is doubtful that a U.S. threat to weaken Soviet political controls by isolating regions inhabited by non-Russian ethnic minorities by means of appropriate strikes will significantly strengthen the U.S. deterrence threat in Soviet perceptions. Not only does the Soviet leadership not seem to anticipate a revolt of these minorities under nuclear war conditions, but it can also afford a temporary loss of control over some of them if this does not dangerously weaken Soviet war fighting capabilities. However, there are indications of real Soviet concern about the possible isolation of economic regions which could result in a decline of the logistic support of military operations.
- o Soviet hardening programs for C³, selected industries and other important installations, as well as stockpiles, suggest a growing requirement for U.S. hard target kill capabilities when executing countervalue strikes.
- o Secrecy and concealment are not only essential elements of Soviet preparations for war survival, they are also important multipliers of their effectiveness. Intelligence collection of information on important Soviet targets should be sensitive to Soviet views on priorities and relative values. In particular, it should focus on those targets which the Soviets deem to be especially sensitive and which they are at great pains to conceal as well as harden. Most notably these should include: C³ command posts, hardened industries and power plants, stockpiles and repair capabilities and protected standby sites for enterprises slated for crisis relocation.
- o There is an urgent need to more fully assess the implications for Soviet perceptions of the credibility and utility of U.S. deterrence, U.S. war fighting capabilities and targeting doctrine, and U.S. potential vulnerability to nuclear blackmail as a result of the present asymmetry in U.S.-Soviet war survival capabilities and strategies.
- o There is a need to assess the potential vulnerabilities of Soviet civil defense plans and measures and their implications for U.S. strategic capabilities, targeting and weapons employment.

APPENDIX

SOVIET EXPERIENCE WITH LOSSES AND RECOVERY DURING WORLD WAR II

Assessments of how the Soviet Union might cope with the destruction and losses resulting from a nuclear war must remain to a large extent speculative in the absence of any historic experience with such a war. Indeed there is no experience with the massive damage to control systems, populations and economies as well as their societal effects which can occur in extremely compressed periods of time in a nuclear war. Even so, in terms of the magnitude of losses of human life, material resources and damage to the national economy, as well as approaches to postwar recovery, the experiences of the Soviet Union during World War II may be instructive. The point is that during that war the Soviet Union suffered losses which, in their magnitude, approached those it may sustain in a nuclear war. Yet, it not only was able to sustain a massive war effort, but also to effect a rapid recovery following the war.

Of course, there are important differences between the character of the manner in which the Soviet Union incurred its losses and damage during World War II and those it may suffer in a nuclear war. First, the losses and damage in World War II were incurred over a relatively protracted period of time, i.e., months and years, while it is likely that in a nuclear war the damage would be inflicted in much more compressed time. Second, in World War II, the greatest part of the Soviet territory remained safe from enemy attacks, which would not be the case in a nuclear war. Third, during World War II, the Soviets were denied temporary access to very important regions of the country as a result of their occupation by the Germans, which is unlikely to happen in a nuclear war. Fourth, during World War II, the Soviets did not have to deal with such problems as the protracted contamination of major areas, or the large-scale exposure of the population to radiation. They did, however, have to cope with massive casualties as well as widespread starvation and disease among the population. Even so, the physical destruction, while slower to occur in World War II, was in many cases just as total as it would be in a nuclear war. The difference between a Stalingrad bombed and shelled into rubble and its destruction following the evacuation of its residents by a nuclear strike may be largely academic.

In assessing Soviet ability to cope with the effects of nuclear strikes, other factors also need to be taken into account. The Soviet Union has undergone great demographic and economic changes since World War II. These changes are reflected in the growth of the Soviet population and in the tremendous growth of Soviet industry and urbanization. More people would be at risk in a nuclear

war than were at risk during World War II. Furthermore, the development of a modern, technologically advanced economy, significantly complicates the problem of sustaining war production and postwar recovery. The technology embodied in present Soviet capital stock is substantially more complex and the industry as well as the economy as a whole are far more interdependent than was the case in World War II, making them more sensitive to disruption and damage. At the same time, however, account must also be taken of the fact that while the Soviet Union had failed to anticipate the German invasion of 1941, it appears to be well aware at present of the character of a potential nuclear attack and has had a long-standing program intended to mitigate the damage and lessen the impact of such an attack.

No doubt, transposing of World War II experiences to a nuclear war is fraught with many uncertainties. Aside from the magnitude of losses and damage in a nuclear war and their effects on national and system survival, it is not known whether the disruption and societal effects are greater or less if the damage occurs over a short period of time or over longer periods of sustained combat and threat of destruction.

In any event, World War II is the only case of Soviet experiences with wartime losses and recovery available for examination. While allowing for all the differences and uncertainties, the Soviet World War II experience appears well worth examining and also keeping in mind when attempts are made to forecast the effects and consequences for the Soviet Union of U.S. retaliatory nuclear strikes.

The discussion below of Soviet World War II losses and recovery does not purport to offer an in-depth and fully detailed examination of that Soviet experience. To do so would require a much greater effort than has been attempted here. It should be noted, however, that since World War II Soviet scholars have devoted considerable attention to this experience. A great many studies have been published about how the Soviet Union coped with its losses and maintained its war effort, as well as how it managed its postwar recovery. The discussion below will be limited largely to pointing out some highlights of this Soviet experience.

A. SOVIET WORLD WAR II LOSSES

The Soviet Union's losses of manpower, material, production capacity and natural resources during World War II were enormous. The major part of these losses were incurred during the first six months of the war, due in large measure to the surprise of the German attack and the swiftness of the German advance. Although the German-occupied area comprised only about 25 percent of the

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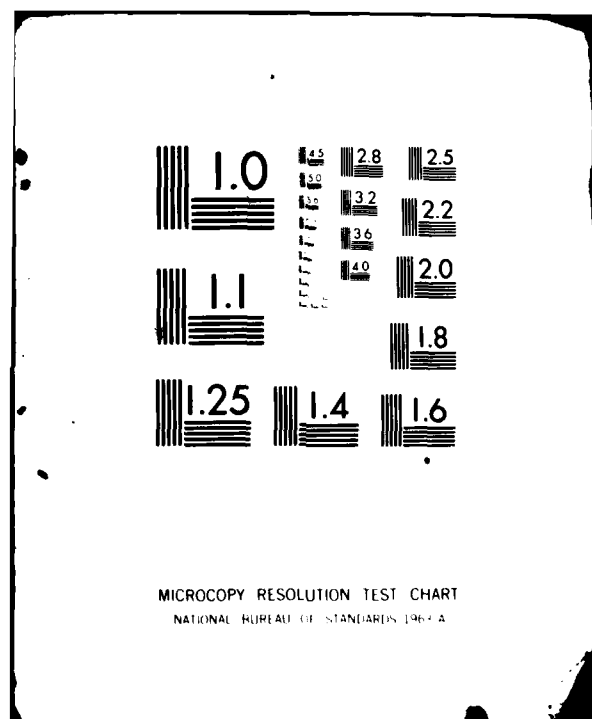
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USSR's total territory, it constituted the main populated, industrial and agricultural region of the country. The whole of the Baltic states (Lithuania, Latvia and Estonia), Moldavia, Ukraine, including the Crimea, and Belorussia, were occupied by the enemy, as well as large sections along the Russo-Finish border. The Soviet Union also lost important industrial and agricultural regions and centers in the RSFSR such as Smolensk, Orel, Bryansk, Kursk, Rostov, Krasnodar, Stavropol, and Stalingrad.

The areas lost to German occupation accounted for some 40 percent of the total population of the USSR, 33 percent of its gross industrial output, 47 percent of sown agricultural areas, 45-50 percent of the livestock and 55 percent of the length of railroad lines.¹ Specifically, the regions occupied by the Germans in the second half of 1941 had produced before the war 63 percent of the country's coal, 68 percent of cast iron, 58 percent of steel, 57 percent of rolled iron, 74 percent of coking coal, 60 percent of aluminum, 71 percent of iron ore, 35 percent of manganese ore, 52 percent of cement, 42 percent of electrical power, 87 percent of sugar, 38 percent of grain.² Additional losses were incurred in 1942 as a result of German advances into the northern Caucasus and to Stalingrad, temporarily raising the loss of grain production to 50 percent.³ In the course of the war, a large number of major Soviet cities were occupied, destroyed or besieged, including Leningrad, Minsk, Gomel, Vilnius, Lvov, Riga, Tallinn, Kishinev, Kiev, Odessa, Kharkov, Krivoy-Rog, Voronezh, Rostov, Dnepropetrovsk, Sevastopol, Donetsk, Stalingrad, etc. Of a total of eleven cities with populations of 500,000 or more, six were captured or besieged. A large portion of cities with populations of 100,000 to 500,000 suffered a similar fate. In addition, the Soviet Union suffered severe human losses as a result of the capture of large elements of the population by the Germans and battlefield casualties. Below is further specific information on Soviet World War II losses.

1

N.A. Voznesenskiy, The Economy of the USSR During World War II (Washington, D.C., Public Affairs Press, 1948), p. 94.

2

G.S. Kravchenko, Ekonomika SSSR v Gody Velikoi Otechestvennoi Voyny (The Economy of the USSR During the Years of the Great Fatherland War) (Moscow: Ekonomika, 1970), pp. 123-124; Ya. E. Chadaev, Ekonomika SSSR v Period Velikoi Otechestvennois Voyny (The Economy of the USSR During the Period of the Great Fatherland War) (Moscow: Mysl', 1965), p. 63; G. Kosyachenko, "The Creation of the War Economy of the USSR in 1941-1945," Planovoye Khozyaistvo (Planned Economy), No. 5, May 1975, p. 52.

3

Chadaev, p. 64.

1. Command and Control

The Soviet governmental and party authorities suffered loss of control over the areas occupied by the Germans. This resulted in the death of large numbers of government workers and party members who had remained for one reason or another in the occupied areas, at the hand of Germans. The CPSU was also weakened by the mobilization during the first six months of the war of over 1,100,000 party members for service with the armed forces. Among them were many "leading" party functionaries from all levels of the party organization.⁴ For example, in the first six months of the war 91,000 party members out of a total of 236,000 members of Moscow's party organization departed for the front, while in Leningrad party ranks during the same period declined by 70 percent, and in Odessa by 90 percent.⁵ Party organizations in safe cities further east lost 50 percent or more of their membership, including many party secretaries from oblast, city and rayon organizations.

Casualties among party members serving at the front were very high. By the end of 1941, it is estimated that half a million party members lost their lives out of a total 1.3 million serving in the armed forces.⁶ In all, total party membership declined from 4 million in June 1941, to 3,064,000 by the end of that year.⁷ The difference represent all party members killed, captured by the Germans, or who remained in the occupied territories. By October 1943, the entire Communist Party of the Ukraine, still in place, had only approximately 1 percent of its prewar membership.⁸ In Kursk,

4

Among 200,000 reservist political workers called up at the start of the war, 14,000 were "leading party workers of party committees." Colonel General P. Gorchakov, "The Immortal Feat of the Soviet People and its Armed Forces," Partiinaya Zhizn (Party Life), No. 9, May 1978, p. 30.

5

Karl W. Ryavec, editor, Soviet Society and the Communist Party (Amherst: The University of Massachusetts Press, 1978), p. 116.

6

Ibid., pp. 114-115; T.H. Rigby, Communist Party Membership in the USSR, 1917-1967 (Princeton, N.J.: Princeton University Press, 1968), pp. 250-251.

7

Rigby, p. 251.

8

Ryavec, p. 116.

in April 1943, the party organization had only 5,000 members, compared with 40,000 in June 1941.⁹ The majority of the party members in Lithuania and Latvia were left behind and perished.

The Party made up for its losses by intensive recruiting, especially in the armed forces. Even so, a high percentage of experienced party cadres were lost and the party organizations in the areas which had been occupied by the Germans were drastically weakened.

The preemptive evacuation of party cadres and government personnel from areas threatened by the German advance resulted in the revolt of a number of small ethnic minority groups, such as the Crimean Tartars, Chechens, Ingushs, Balkars, Kalmyks and Circassians. Subsequently, as a result of the destruction of the Soviet control apparatus, the Soviet authorities had to contend with guerrilla warfare and armed resistance in the Western Ukraine (primarily areas annexed from Poland in 1939) and the Baltic states.

By and large, however, elements of the population collaborated with the Germans only after they came under German occupation or became military prisoners. Even so, on the scale of the Soviet war effort and the size of the Soviet armed forces, these revolts and instances of active collaboration with the enemy had little bearing on the course and outcome of the war.

2. Population Losses and Decline of the Labor Force

The rapid call-up of reservists for active military service, the additional formation of large units of the "Narodnoe Opolcheniye" (People's Volunteer Corps)¹⁰ mainly recruited among workers in cities threatened by the German advance and the territorial gains by the invading German forces, sharply reduced the size of the labor force. The average number of workers and employers in the national economy declined from 33.9 million in 1940 to 19.8 million in

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Rigby, p. 262.

¹⁰

About 400,000 Soviet citizens, mainly workers and farmers, served in the "narodnoe opolcheniye." Many were killed or captured by the Germans. Sovetskaya Voennaya Entsiklopediya (Soviet Military Encyclopedia), Vol. 6 (Moscow: Voenizdat, 1978), p. 497.

November 1941, and 18.4 million in 1942.¹¹ While the overall number of workers and employers declined by 46 percent, the size of the work force employed in industry declined by 34.6 percent.¹² In part, the losses in the industrial labor force were made up by recruitment of women and youth, but by early 1942 the defense industries were significantly short of workers, especially of skilled ones.¹³ In the agricultural sector, women and adolescents became the principal production force.

The USSR also suffered a massive, if temporary, loss of population to German occupation. In 1940 the population of the Baltic States, Belorussia, Moldavia and Ukraine had totaled some 59 million, and some 65 million had lived in the entire territory occupied by the Germans.¹⁴ According to Soviet reports, 143,000 persons out of a total of 5.8 million were evacuated from the Baltic States, 1.5 million out of 9.1 million from Belorussia, and 3.5 million out of 41.5 million from the Ukraine.¹⁵ In all, some 25 million persons were evacuated in the course of the war, 17 million of them during the first six months of war (of whom 10 million were moved by rail.)¹⁶ It appears, however, that in 1941-1942, on the order of 45 to 50 million Soviet citizens were in the German occupied areas for various lengths of time, representing at least a temporary loss to the Soviet state of some 25 percent of its population. Substantial numbers of these citizens, especially Jews and those in partisan units, were killed in the course of the occupation.¹⁷ In addition, large numbers of residents in the occupied areas (apparently over 6 million) were sent to Germany as slave laborers or voluntarily elected to retreat there with the German forces during 1944-1945. Of these, a substantial number remained in the West after the end of the war.

11

Kravchenko, p. 127.

12

Ibid.

13

Ibid., p. 109.

14

A. Dallin, German Rule in Russia, 1941-1945 (New York: St. Martin's Press, 1957), p. 365.

15

Sh. M. Munchaev, "The Evacuation of the Population in the Years of the Great Fatherland War," Istoriya SSSR (History of the USSR) No. 3, May-June 1975, pp. 135-136.

16

Ibid., pp. 137-138.

17

For example, see N.S. Khrushchev, report to the Ukrainian Supreme Soviet, March 1, 1944, Bolshevik, No. 6, March 1944, p. 17.

The Soviet armed forces also suffered heavy losses. During 1941-1942 some 6 million Soviet soldiers were captured by the Germans or deserted to them. Many of the prisoners died in captivity (according to Soviet claims on the order of 4 million). Combat losses were also extremely heavy.

Soviet estimates place the wartime military and civilian losses at 20 million. In addition, some three million servicemen were disabled. However, the Soviet population in 1945 has been estimated at 165 million, as compared with 197 million in June 1941, indicating a decline of 32 million. Western demographers have inferred from the 1959 Soviet population census that the total demographic loss suffered by the Soviet Union, including direct wartime losses and lost population growth, amounted to some 45 million or close to a quarter of the mid-1941 population.¹⁸ Obviously, the Soviet Union suffered a demographic disaster of major magnitude. While these losses were incurred over a period of several years, their size is roughly comparable or even in excess of the fatalities which some Soviet publications claim the Soviet Union is likely to suffer in a nuclear war, i.e., six to eight percent of the urban population.

3. Economic Losses

In the period of the first six to eight months of the war, the Soviet Union suffered a staggering decline in its economy. This was caused by a combination of destruction, loss to German occupation, and the evacuation of 1,523 industrial enterprises (among them 1,360 large ones) to eastern regions of the country.¹⁹ While the latter were later put into production, their relocation also contributed at least temporarily, to a substantial decline in industrial production. In any event, the speed of the German advance and the disruption of the railroad transportation prevented the evacuation of industries from the most westerly regions of the country.

¹⁸

W.W. Eason, "The Soviet Population Today: An Analysis of the First Results of the 1959 Census," Foreign Affairs, July 1959; J.W. Brackett, "Demographic Trends and Population Policy in the Soviet Union," in Dimensions of Soviet Economic Power, Studies Prepared for the Joint Economic Committee, Congress of the United States (Washington, D.C.: U.S. Government Printing Office, 1962), p. 510.

¹⁹

Kravchenko, p. 113; Chadaev, p. 75. A good deal of the equipment was moved hastily, with little control and with no indication who owned it, or where it was supposed to be sent. Kosyachenko, pp. 66-67.

According to the "official" Soviet history of the war, the economic situation of the country by late 1941 is summarized as follows:

In the late autumn of 1941 our country lived through its most difficult days, both militarily and economically. . . . By the end of October 1941, not a single metallurgical plant in the South was operating. Of the blast furnaces in operation on June 1, 1941, only 38.4 percent were working; of the open-hearth furnaces, only 52.6 percent; of the electric steel smelting furnaces, only 38.6 percent; of the rolling mills, only 52.2 percent. Compared with June 1941, metal production amounted to 32.4 percent of cast iron, 42.3 percent of steel, and 42.5 percent of rolled iron. By December 1941, the production of pig iron in comparison with June declined by more than four times, the production of steel and rolled iron by more than three times.²⁰

According to Soviet sources, by January 1942, the Soviet Union had lost among others 303 defense plants, 61 (58%) blast furnaces, 204 (49%) open hearth furnaces, 150 (46%) rolling mill and 14 (80%) pipe mills, 204 (87%) coke ovens, 100% of converters and 73% of electric furnaces.²¹ At least 61 large electric power stations were lost and later destroyed.²² Some of the dynamics of the decline in essential production are reflected in the following table:

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P.N. Pospelov, editor-in-chief, Istoriya Velikoi Otechestvennoi Voyny Sovetskogo Soyuza 1941-1945 (History of the Great Fatherland War of the Soviet Union 1941-1945), Vol. 2 (Moscow: Institute of Marxism-Leninism of the CPSU Central Committee, 1961), p. 160.

21

Kravchenko, p. 128.

22

Ibid., p. 144.

Monthly Soviet Production for July 1941 to March 1942²³
(in % of June 1941)

	1941						1942		
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March
Pig Iron	94	71	57	34	24	23	23	20	23
Steel	89	72	60	45	37	36	33	29	34
Rolled Iron	90	70	54	42	34	32	30	26	30
Coal	105	96	62	44	37	35	33	32	35
Oil	102	100	95	96	69	66	62	56	62
Metal Leath						26	21	22	24
Electric Power						52			
Automobiles	98	96	61	48	16	17	6	4	13

For a large number of industrial categories, February 1942 marked the lowest point in Soviet output. Some increase was achieved thereafter in 1942 as a result of the expansion of production of surviving capacities, the start-up of evacuated enterprises and the completion of construction of new enterprises and electric power stations in the secure regions of the country. Even so, the production in 1942 was significantly smaller in nearly all categories as compared to 1941. For example, production of pig iron was 34.6 percent of 1941, steel 45 percent, rolled iron 43 percent, coking coal 37.3 percent, pipes 39 percent, iron ore 39.5 percent, manganese ore 33.4 percent, metal leath 51.6 percent (and 39 percent of 1940 production), oil 66 percent, while compared to 1940, coal output was down to 45 percent, cement to 32 percent, roofing materials to 26 percent.²⁴ Electric power output in the first quarter of 1942 was 50 percent of the second quarter of 1941, and for the year 1942 the total electric output was 60 percent of 1940. Production of chemicals also suffered considerable decline. For example, the output of caustic soda in 1942 was 44 percent of 1940,

²³

Ibid., pp. 130, 143, 144, 199.

²⁴

Ibid., pp. 129, 136, 140.

carbonated soda 12 percent, sulfuric acid 41 percent, and synthetic ammonia 49 percent.²⁵ The production of the textile industry was 62 percent of 1940, and of the food industry 42 percent.²⁶ Freight turnover on the railroad declined from 95 billion ton/km in the third quarter of 1941 to 43 billion ton/km in the first quarter of 1942.²⁷

As was noted, the Soviet Union lost a substantial portion of its agricultural production. Consequently, production in 1942 as a percentage of the 1940 production was: gross agricultural output 38 percent, grain 34 percent, sunflower seed 8 percent, sugar beets 9 percent, raw cotton 59 percent, and flax fiber 44 percent.²⁸ In 1942 refined sugar production was 5 percent of 1940, butter 49 percent, and flour 54 percent.²⁹ The overall size of the Soviet livestock herd had declined by 48 percent by January 1943, as compared with January 1941, causing a sharp drop in meat and milk production.³⁰

An exception to the decline was the nonferrous metals industry which was largely located in the non-German occupied regions and was able to increase production. The decline in oil production was due not so much to any destruction of oil fields and refineries as to technical and transportation difficulties. The Soviet Union was also fortunate in having large electric power producing capacities in the non-occupied regions. It was able, therefore, to supply needed power to the remaining as well as evacuated industries.

It is, nevertheless, worthy of notice that during the period of December 1941 to February 1942, or some six to eight months after the beginning of the war, Soviet industrial output in most basic categories was down by an average of some 70 percent, as compared to prewar production. During 1942, in comparison with the preceding year, production was down by an average of 60 percent, and more

²⁵

Ibid., p. 147.

²⁶

Ibid., pp. 148, 149.

²⁷

Ibid., p. 168.

²⁸

Ibid., p. 155; Pospelov, *Istoriya Velikoi Otechestvennoi Voiny Sovetskogo Soyuza 1941-1945*, Vol. 6 (Moscow: Institute of Marxism-Leninism, 1965), p. 45.

²⁹

Ibid., p. 148.

³⁰

Ibid., p. 155.

than that in agriculture. In effect, therefore, despite increases in production after February 1942, Soviet industry, transportation and agriculture had suffered a catastrophic, if to some extent, temporary decline.

In the course of the war, the German occupied areas suffered extensive physical destruction. In addition, the Germans removed a considerable amount of Soviet property. For example, Soviet sources claim that during the war 14 steam boilers, 1,400 electric turbines and 11,300 electric generators were sent to Germany from looted Soviet electric power stations.³¹ Similarly, large amounts of industrial machinery, railroad rolling stock and agricultural equipment, as well as livestock were sent to Germany. A Soviet list of property destroyed or looted, published after the war included:

Partial List of Destroyed or Looted Soviet Property³²

Factories	31,850	
Blast furnaces	62	
Open hearth furnaces	213	
Large electric power stations	61	(total capacity 5 million kw)
Metal cutting machine tools	175,000	
Hammers and Presses	34,000	
Coal cutters	2,700	
Pneumatic drills	15,000	
Spindles	3,000,000	
Weaving looms	45,000	
Railroad tracks (in kilometers)	65,000	(50% of tracks in occupied areas)
Railroad bridges	13,000	
Locomotives	15,800	
Railroad cars	428,000	
Passenger, freight & steam ships and barges	8,309	
State farms (sovkhozes)	1,876	
Collective farms (kolkhozes)	98,000	
Tractors	137,000	
Combines	49,000	

³¹

Ibid., p. 147.

³²

Voznesenskiy, pp. 95-96; Kravchenko, pp. 126, 144; Army General S.K. Kurkotkin, chief editor, Tyl Sovetskikh Vooruzhennykh Sil v Velikoi Otechestvennoi Voine 1941-1945 (The Rear of the Armed Forces in the Great Fatherland War 1941-1945) (Moscow: Voenizdat, 1977), p. 522.

Partial List of Destroyed or Looted Soviet Property (continued)

Grain sowing machines	46,000
Threshing machines	35,000
Horses	7,000,000
Cattle	17,000,000
Cities and Towns	1,710
Villages and rural settlements	17,000
Urban dwellings*	1,209,000 (about 50% of all urban housing in the occupied areas)
Rural dwellings*	3,500,000 (about 30% of dwellings in the occupied areas)
Hospitals and clinics	39,000

*Soviet sources also claim that "about 25 million people" were left homeless, I. Kuz'minov, "The Termination of the War and the Shift of the Economy to Peacetime Development," Bolshevik, Nos. 17-18, September 1945, p. 34.

The Soviets claim that the overall war losses constituted "about 30 percent of the national wealth of the country."³³ Some western scholars believe that the permanent losses of fixed capital may have been somewhat smaller.³⁴

B. WARTIME RECOVERY EFFORTS

From 1942 through 1945 the Soviet Union maintained a high rate of investment in new fixed capital in defense industries, metallurgy, coal and other mining, and electric power generation in the eastern regions to further strengthen war production. Also in this period the evacuated enterprises resumed production, adding substantially to the volume of armaments and equipment supplied to the armed forces. At the same time, however, substantial resources were allocated to the recovery of Soviet territories liberated from the Germans. This effort became increasingly important after mid-1943.

³³

Kurkotkin, p. 522; Yu. Prikhodko, Vostanovlenie Industrii, 1942-1950 (Reconstruction of Industry, 1942-1950) (Moscow: Mysl', 1973), p. 3.

³⁴

R. Moorsteen and R.P. Powell, The Soviet Capital Stock, 1928-1962 (Homewood, Ill., 1966) p. 74.

The problem of economic recovery of the liberated territories was complicated by a shortage of cadres, especially party cadres, in those areas. As each area was liberated, the party set about rebuilding its organizations and membership. While the armed forces and KGB established the initial control, the party went about reconstituting city, rayon and oblast party committees. The nucleus of the party organization consisted of the underground members who had survived under German occupation, after they had been carefully screened; new cadres who came in with the Soviet armed forces, and evacuated party members who returned from the eastern regions. To these were then added new local recruits.³⁵ Groups of party members were organized in the liberated areas to be installed as the party nucleus in the areas still awaiting to be liberated.³⁶ The main buildup of the party organization in the liberated territories, however, took place after the end of the war, following the demobilization of Soviet soldiers. For example, the Ukraine, which before the war had 521,000 party members and candidates, had in the liberated portions of it 5,615 in October 1943, 16,816 in November 1943, 55,931 in January 1944, 115,595 by July 1944, and 195,764 by July 1945.³⁷

In February 1943 the State Planning Commission (Gosplan) was charged with drawing up plans for the restoration of the liberated regions for 1943-1947. In August 1943 a Joint Party-Government decree was issued on "urgent reconstruction measures." The State Planning Commission established a Directorate of Economic Reconstruction in the Liberated Regions, which set reconstruction priorities, inventoried available assets and planned their utilization.³⁸ In addition, there was established a Committee for Reconstruction of Liberated Regions, under the Council of Peoples' Commissars (now called Council of Ministers), to administer the implementation

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Rigby, pp. 262-264; Pospelov, *Istoriya Velikoi Otechestvennoi Voyny Sovetskogo Soyuza, 1941-1945*, Vol. 4 (Moscow: Institute of Marxism-Leninism, 1962), pp. 617-627.

36

Rigby, p. 263.

37

Ibid., p. 265.

38

Prikhodko, p. 15.

of the Council's plans. To assure the rapid reconstruction of important enterprises and to cut through bottlenecks, their restoration was supervised by special representatives of the State Defense Committee (GKO), Party Central Committee, and Council of Peoples' Commissars. In 1943, 16.3 percent of total Soviet capital investment went for reconstruction, and in 1944, it rose to 41.6 percent.

Soviet economic restoration in the liberated regions focused mainly on those sectors and installations which could contribute to the war. It was said that "raising and consolidating heavy industry--coal and oil industries, ferrous and non-ferrous metal-lurgy and electric power stations--must be the leading link in the reconstruction of the economy of the liberated regions."³⁹

The initial effort centered on the restoration of the Mosbass coal mining region near Moscow which had been recaptured in late 1941 after a brief but destructive German occupation. In the restoration of these mines, 6,000 evacuated coal miners from the Donbass were used as well as Moscow subway builders and improvised machinery produced by Moscow's plants. As a result of these efforts, the Mosbass coal output was restored to the prewar level by October 1942, and by 1944 its output was more than double that of 1942.⁴⁰

After a false start in 1942 following the temporary recapture of Rostov, reconstruction of liberated areas began in earnest after mid-1943 in the wake of the Kursk offensive. There were three main considerations which motivated Soviet urgency to begin the reconstruction of the liberated areas immediately following their liberation. One was the need to further strengthen the Soviet economy and especially defense production. Another was to shorten the lines of logistic support to the armed forces, because most of their support had been coming from the eastern regions of the country, which were far removed from the front. Finally, it was necessary to take steps to sustain and employ the liberated population.

³⁹

B. Sukharevskiy, "The Restoration of the Economy of Liberated Districts," Planovoe Khozyaistvo, No. 2, 1944, p. 19.

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Prikhodko, p. 36; Kravchenko, p. 242.

Priority in the reconstruction program was given to railroads, coal, electric power, metallurgy, and defense enterprises.⁴¹ In essence, efforts were concentrated predominantly on those industries which could make an early contribution to the war effort. The same industries, however, were very suited to facilitate the postwar recovery. To expedite the recovery, use was made of many of the previously evacuated construction organizations, as well as of specialists on active duty with the armed forces.

A major effort was made to restore the Donbass coal mining region in the Ukraine and the Ukrainian iron and steel industries. By the end of 1944, 106 main mines were in operation, including 67 at full capacity, with an annual capacity of 29.2 million tons.⁴² By 1945, 123 basic coal mines and 506 medium or small mines had been put back into operation, and coal extraction in the Ukraine reached 36 percent of its prewar level.⁴³ Along with coal, major efforts were made in 1944 to rebuild 33 iron ore mines in the Krivoy Rog basin. By 1945, these and other Ukrainian iron ore mines produced at least 19 percent of the prewar level.⁴⁴

Revival of industry also proceeding fairly rapidly despite difficulties in obtaining replacement machinery and equipment because most of Soviet industries worked for defense. Even so, during 1943-1944, the Soviets succeeded in putting back into operation: electric power stations with a total capacity of one million kw, 43,000 km of rail lines, 11 blast furnaces, 45 steel

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Kosyachenko, p. 58.

42

Prikhodko, p. 110. Prewar Ukrainian coal output had been 83.8 million tons. The plan had called for the reconstruction of 119 mines.

43

Chadaev, p. 169. According to the Academy of Sciences of the USSR, *Ocherki Razvitiya Narodnogo Khozyaistva Ukrainskoi SSR* (Essays on the Development of the Economy of the Ukrainian SSR) (Moscow: Akademiya Nauk SSSR, 1954), p. 461, coal production in 1945 reached 38.5 percent of the prewar output.

44

Chadaev, p. 169. See Also A. Omarovskiy, "The Postwar Restoration of Ukrainian Machine Building," *Voprosy Ekonomiki* (Questions of Economics), No. 10, October 1949, pp. 56-57.

furnaces, 22 rolling mills, 10 metallurgical plants, and by the end of the war, 13 blast furnaces, 70 steel furnaces, and 28 rolling mills. Reopened aircraft plants produced 26 percent of their 1940 volume.⁴⁵ In 1945 the Ukraine produced, as compared with 1940, 17 percent of pig iron, 16 percent of steel, 15 percent of rolled iron, 25 percent of electric power, and 15 percent of metal cutting machine tools.⁴⁶

The revival of agriculture in the Ukraine, a major food producing region was slower. In 1943-1944 the machine-tractor stations received some 4,700 tractors, including 1,329 tractors which had been evacuated and some 43 percent of the prewar tractor park of 90,000 tractors was recovered. Ukrainian agriculture also received some 1,000 new vehicles, mainly American made, and 4,650 vehicles returned by the armed forces but "requiring repairs."⁴⁷ Some of the evacuated livestock was also brought back. In addition, the 1944 plan called for the repair or reconstruction of 2 million square meters of "living space." In all, by the end of the war, 84,700 collective farms, 1,883 state farms and 3,093 machine-tractor stations in the liberated regions were restored and put back into production, and agricultural production rose to 51 percent of the prewar level.⁴⁸

In the case of Belorussia, industrial output in December 1944 was only 10 percent of the output in December 1940. Among other losses, the republic had 209 cities and towns and 9,200 villages destroyed, and, according to the Second Secretary of the Belorussian CPSU Central Committee, "everything had to be built anew."⁴⁹ In the Moldavian Republic, total industrial output in 1945 amounted to 40 percent of the 1940 output, electric power output was down to 48 percent of prewar, refined sugar to 21 percent (in the Ukraine it was 16 percent of the 1940 output).⁵⁰

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Yu. A. Prikhodko, "Restoration of the Industry in the USSR Regions Liberated from German-Fascist Occupation," Istoriya SSSR, No. 6, June 1968. p. 19.

46

Ibid.

47

Khrushchev, Bolshevik, No. 6, March 1944, p. 28.

48

Pospelov, Vol. 6, p. 352.

49

A. Aksenov, "Sixty Heroic Years," Kommunist Voorzhennykh Sil, No. 24, December 1978, pp. 11-12.

50

Chadaev, p. 169.

In summary, the regions which had been occupied by the Germans produced in 1945 as a percentage of 1940 as follows:

Production in Liberated Soviet Regions, 1943-1945⁵¹
(in percentage of 1940)

	1943	1944	1945
Iron ore	1.0	6.0	20.0
Pig iron	2.6	10.4	20.5
Steel	0.5	8.2	15.5
Rolled iron	0.1	7.0	16.0
Coke	0.05	10.0	20.0

Overall, despite the repairs and restoration of damaged enterprises, the production of evacuated enterprises and the construction of new enterprises and power plants, the USSR produced in 1945 as a percentage of 1940: cast iron 59 percent, steel 84 percent, rolled iron 65 percent, coal 90 percent, oil 62 percent, electric power 89 percent, agricultural output 60 percent, and only 76 percent of the prewar cultivated area was sown.

C. EXTERNAL INPUTS TO SOVIET RECOVERY

In the course of the war and following it, the Soviet Union's economy received large inputs from external sources, which significantly facilitated and speeded up its recovery. These external sources included: wartime and immediate postwar aid by the allies, in particular the U.S. Lend-Lease program, aid by UNRRA to the devastated regions of the USSR, requisitions and "war trophies" (i.e., war booty) taken by the Soviet Union in enemy countries, and reparations by former Axis powers and their allies.

1. Lend-Lease Aid

In addition to military equipment and supplies for the Soviet armed forces, the Soviet Union received from the Lend-Lease program industrial and transportation equipment, including entire plants, agricultural and construction machinery, essential raw materials, and so on. While total U.S. shipments to the Soviet Union in the

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Kravchenko, p. 239.

course of the war were valued at about \$10 billion, the depreciated value of deliveries of equipment which could be of peacetime value to the Soviet economy was estimated at \$2.6 billion.⁵³ In addition, some \$300 million worth of machinery, supplies and equipment were shipped to the Soviet Union in 1945-1946 under a U.S. long-term credit grant.⁵⁴

Among the equipment and supplies sent to the Soviet Union during the war to bolster the Soviet economy were: in excess of 44,600 machine tools, several oil refineries with a total capacity of two million tons per year, a tire manufacturing plant with a capacity of one million tires per year, power generating equipment with a capacity to produce 1.4 million kw, and auxiliary steel manufacturing equipment to increase Soviet steel production by 2.5 million tons. Soviet transportation capabilities were augmented by the delivery of 12,300 km of railroad tracks, 1,966 locomotives, 13,041 freight cars and 401,000 trucks. It has been estimated that in 1944 one-half of the total Soviet investments in machinery consisted of imported equipment.⁵⁵

2. UNRRA Aid to Belorussia and the Ukraine

During 1945-1947, the United Nations Relief and Rehabilitation Administration provided direct assistance to the reconstruction of the Belorussia and Ukrainian republics. The UNRRA program allocated \$189 million for aid to the Ukraine and \$11 million for aid to Belorussia.

The UNRRA aid consisted mainly of shipments of food (53 percent of the total value), clothing, textiles and footwear (some 10 percent of the total), agricultural machinery and industrial

52

Chadaev, p. 208, Kosyachenko, p. 59.

53

M.L. Harvey, East-West Trade and United States Policy (New York: National Association of Manufacturers, 1966), p. 73. Shipments of non-military supplies were estimated at some \$4 billion, including \$306 million in machine tools, A.S. Milward, War, Economy and Society, 1939-1945 (Berkeley, Cal: University of California Press, 1977), pp. 71, 73.

54

Harvey, pp. 71-72.

55

R. Moorsteen, Prices and Production of Machinery in the Soviet Union, 1928-1958 (Cambridge, Massachusetts, Harvard University Press, 1962), p. 430.

equipment (9 percent and 28 percent of total value respectively). The aid included 2,280 tractors and other farm machinery. Industrial rehabilitation supplies were intended to assist the restoration of urban utilities, housing, as well as mines and industries. A large part of assistance to industry was in the form of equipment for the restoration of electric power stations.

3. Procurement and War Booty Taken in Non-Soviet Territories

After the Soviet armed forces crossed the Soviet border, the Soviet Union instituted a system of "theater procurement" as well as the collection of "war trophies," which resulted in a systematic looting of the territories occupied by Soviet forces. With the crossing of the Soviet border, Soviet troops subsisted mainly or entirely on the basis of requisitioned local resources and war booty, both in friendly countries such as Poland, Czechoslovakia and Yugoslavia and in enemy countries. The collection of the latter was the responsibility of the War Trophy Service of the Soviet Armed Forces, consisting of special units for collecting, securing, shipping and storing of what the Soviet authorities identified to be "war booty."⁵⁶ Included in the requisitioned and "war booty" supplies were food, fuel, fodder, transportation equipment, and so on.⁵⁷ According to Soviet sources, "seized" food and fodder for troop supply in 1944-45 amounted to 4.8 million tons.⁵⁸

Soviet requisitions and seizures, however, went beyond the requirements for sustaining the Soviet armed forces. The Soviet armed forces also collected all sorts of goods and supplies for shipment to the Soviet Union. Indeed, Soviet divisions were assigned collection quotas. Included were large amounts of food supplies such as grain and meat, and some 7 million heads of livestock. Also seized and shipped to the Soviet Union were 35,000 tractors and various

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For example, see Kurkotkin, pp. 373-385.

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Pospelov, Vol. 6, p. 123; Yu. V. Plotnikov and I.N. Chaban, "The Rear of the Soviet Armed Forces During the Years of the Great Fatherland War," *Istoriya SSSR*, No. 1. January 1975, pp. 16-18.

⁵⁸

Colonel General V.H. Dutov, et al., *Finansovaya Sluzhba Vooruzhennykh Sil SSSR v Period Voyny* (The Finance Service of the Armed Forces of the USSR in the War Period) (Moscow: Voenizdat, 1967), p. 130.

farm machinery, 6,000 km of railroad tracks, several thousand locomotives and a large number of railroad cars, and some 100,000 motor trucks and cars.⁵⁹ The Soviet troops also "liberated" and sent home large amounts of household goods belonging to the citizens in the occupied territories, including pianos, toilets and sinks, clothing, etc.

4. Dismantling of Fixed Installations

The Soviets also undertook a massive program of dismantling of industrial plants and other fixed facilities, mainly but not solely in Soviet occupied Germany, for shipment to the Soviet Union. The value of the removed capital stock has been estimated to have been in the range of \$1.6 to \$2 billion (prewar value), but precise data is lacking.

The dismantling began while the war was still in progress and continued into 1947. Much of it was conducted in a chaotic manner, especially at the beginning, and a considerable amount of the removed machinery and equipment was damaged or lost. Even so, it has been estimated that such "acquisitions" accounted in 1944 for 15.4 percent of total Soviet capital investment, and for 21.8 percent in 1945, and 22.1 percent in 1946.⁶⁰

In addition, the Soviet Union obtained various amounts of industrial and transportation equipment in Romania and Hungary, and in Manchuria. Furthermore, the Soviet economy gained from the annexation of East Prussia and Finnish territories.

Overall, therefore, even while some of the seized industrial equipment was wasted, it nonetheless made a significant contribution to the Soviet Union's economic recovery. For one thing, it served to replace Soviet losses. For another, the dismantling program resulted in a large infusion of technology into the Soviet economy. Undoubtedly, the Soviet Union's economy benefitted not only from the quantity of machinery and equipment added to its capabilities, but from their superior quality. For example, by the end of 1945, Soviet inventory of metal-cutting machine tools substantially exceeded the 1940 level.

59

Plotnikov and Chaban, p. 17; F. Rupp, Die Reparations Leistungen des Sowjetischer Besatzungszone (Reparation Performance of the Soviet Occupied Zone) (Bonn, 1951), passim; R. Slusser, editor, Soviet Economic Policy in Postwar Germany (New York: Research Program in the USSR, 1953), passim.

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Moorsteen, pp. 430-431.

5. War Reparations

In addition to the "war trophies" which the Soviet Union removed from the occupied territories, it extracted war reparations from the defeated enemy countries. The heaviest reparations were levied on East Germany. In addition, the Soviets obtained raw materials and goods by bilateral agreements with Poland and Czechoslovakia, which sold them to the Soviet Union at "special prices." It was made clear that the reparations were to contribute to the fulfillment of the Soviet Union's first postwar (1946-1950) Five Year Plan.

Soviet reparations levied on East Germany included not only the maintenance of Soviet occupation forces, but also the production of a variety of industrial machinery and equipment, as well as transportation equipment. Furthermore, the Soviets converted two hundred of the largest industrial enterprises into Soviet-owned joint stock corporations and required them to produce for the Soviet Union. While no reliable figures have been published on the amount of reparations the Soviet Union extracted from East Germany, in addition to the "war trophies" (during the period 1945-1950), it has been estimated at some \$7.7 billion. In all according to a West German estimate, by 1950 the Soviet Union had taken from Germany economic resources valued at some \$10.7 billion.⁶¹

The former German allies also paid reparations to the Soviet Union. Finland was to pay \$300 million, much of it in machinery, equipment and raw materials. It discharged this obligation by 1950. Romania was also charged \$300 million in reparations to be paid in oil and oil products, grain, machinery, ships, livestock, etc. In addition, the Soviet Union seized various German assets in that country. Hungary's reparations were set at \$300 million, but was later reduced to \$65.7 million. The value of reparations from former enemy states was calculated in 1938 prices. In the case of Poland, it was required to assign 25 percent of industrial installations in the territories it had annexed from Germany to the Soviet Union. The Soviet claim was later renounced in favor of long-term deliveries to the USSR of Polish coal at "special prices."

⁶¹

See Rupp.

Taken all together, the external inputs to the Soviet economy played a major role in its postwar recovery. While the precise share of their contribution to the success of Soviet industrial recovery by 1950 cannot be determined, it is clear that these inputs not only greatly eased the reconstruction burden on the Soviet economy, but also made it possible for the Soviet Union to sustain its population in the immediate postwar years.

D. THE SOVIET FOURTH FIVE-YEAR PLAN (1946-1950)

The Fourth Five-Year Plan, launched in 1946, was described as a plan for the "rehabilitation and development" of the Soviet postwar economy.⁶² Its start was not entirely auspicious. In 1946 Soviet agriculture was struck by a disastrous drought. Furthermore, the conversion of the economy from war to peacetime production resulted in a significant decline in industrial output.⁶³ Furthermore, as was noted, the 1945 industrial output of the liberated Soviet regions only amounted to 30 percent of the 1940 level.⁶⁴

The main aims of the Fourth Five-Year Plan were defined as "the reconstruction of the country's war-ravaged regions," the restoration of industry and agriculture "to their prewar level," and to "surpass this level considerably."⁶⁵ First priority was given to the reconstruction and development of heavy industry and railroad transportation. This plan also called for the rehabilitation and expansion of agriculture and the consumer industry "to provide the country with a plentiful supply of the basic consumer goods," and in order to achieve an early end to wartime rationing.⁶⁶ The plan also included a requirement to "further increase the defense capability of the USSR."⁶⁷

62

N.A. Voznesenskiy, "The Five-Year Plan for Rehabilitation and Development of the USSR National Economy," Bolshevik, No. 6, March 1946, pp. 69-92.

63

Kosyachenko, p. 59. The gross industrial output in terms of the 1940 level declined from 91 percent in 1945 to 77 percent in 1946, and for producer goods (Group A), to 70 percent.

64

Kravchenko, p. 224.

65

Voznesenskiy, p. 72.

66

Ibid.

67

Ibid., p. 73.

The main focus of the plan was on the recovery of the producer goods industries, and therefore called for a high rate of investment in them. Thus, in the allocation of investments over the five year period, 63 percent went to industry (43.2 percent to producer industries), 16 percent to transportation, and 17 percent to state housing, leaving only 4 percent for all other sectors, including agriculture. In the industrial sector the set output targets were to significantly exceed prewar production levels.⁶⁸ At the same time, gross agricultural production was to exceed the 1940 level by 27 percent, and grain production by 31 percent.

The results of the plan fulfillment were mixed. In industry, the Soviet Union not only recovered from the war damage but exceeded prewar levels of production. Thus, in terms of gross industrial output, the level achieved by 1950 surpassed the 1940 level by 71 percent. The producer industries (group A) exceeded the 1940 level by 105 percent, and the consumer industries (group B) by 22 percent.⁶⁹ According to Soviet statistics, prewar levels of output were achieved: for pig iron in 1949, for steel in 1948, for rolled iron in 1948, for coal in 1947, for electric power in 1946.⁷⁰ By 1950 a number of industries, such as iron and steel, coal, electric power, machine building and transportation had exceeded the planned production targets. The Ukraine and Belorussia exceeded the 1940 level of gross industrial output by 15 percent.⁷¹

The agricultural sector, however, not only failed to meet the targets set by the plan, but continued to fall short of the 1940 level. In terms of gross agricultural output, production at the end of the plan amounted to 99 percent of the 1940 level. No doubt, this was made possible by the large infusion of machinery, livestock, grain, etc., from external sources. Food rationing

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The plan had called for iron and steel production to exceed the 1940 level by 35 percent, coal by 51 percent, electric power by 70 percent, cement by 80 percent, aluminum by 100 percent, machine building by 100 percent, chemicals by 50 percent, oil by 14 percent. *Ibid.*, pp. 74-75.

69

Central Statistical Administration, *Narodnoe Khozyaistvo SSSR za 60 Let* (USSR National Economy Over 60 Years) (Moscow: Statistika), 1977, p. 14; "On the Results of the Implementation of the Fourth Five-Year Plan of the USSR, 1946-1950," *Voprosy Ekonomiki*, No. 5, May 1951, pp. 3-13.

70

Chadaev, pp. 207-208.

71

Kosyachenko, p. 59.

was abolished in 1947, but shortages continued. The 1950 grain harvest was only 85 percent of the 1940 crop, and the area under cultivation was still smaller than in 1940. The 1950 harvests of potatoes, however, exceeded the 1940 crop and meat production was at about the prewar level. The cattle herd was larger than in 1940.

One added factor which contributed to limiting the availability of food to the population was the Soviet government's effort to build up state grain reserves, apparently as a defense measure. By the end of the war, despite severe hunger among the population, the Soviets had reconstituted their prewar reserve of 6 million tons of grain.⁷² During the Fourth Five-Year Plan, the Soviet authorities continued their efforts to build up this reserve. It has been estimated that by 1950 this reserve had grown to some 27 million tons.⁷³

Reconstruction of destroyed housing was also slow. During the Fourth Five-Year Plan, some 100 million square meters of housing floor space in cities and towns were repaired or built, and 2.7 million homes were built for farmers.⁷⁴ However, housing shortages continued well into the 1960s.

On the whole, however, it can be said that the Soviet Union succeeded in accomplishing its recovery from the ravages of World War II by 1950 or four and a half years after the cessation of hostilities. In carrying out its recovery program, the Soviet leadership was ruthless in setting priorities, although not always efficient in implementing them. This ruthlessness was reflected in the wartime priorities given in the devastated areas to the reconstruction of whatever could support the war effort. It was further demonstrated in the squeezing of resources from sources outside the Soviet Union, enemy as well as allied. It was finally shown in the Fourth Five-Year Plan in the overwhelming priority given to the reconstruction and buildup of heavy industry over the consumer sector and agriculture. The leadership's goal during as well as after the war to maximize Soviet national power and military capabilities. It cannot be denied that it was successful in achieving those goals.

72

G. Sorokin, "The Great Economic Victory of the USSR in the War Against Fascist Germany," Voprosy Ekonomiki, No. 5, May 1975, p. 4.

73

N. Nimitz, Soviet Government Grain Procurements, Dispositions, and Stocks, 1940, 1945-1963 (Santa Monica, California: The Rand Corporation, RM-4127-PR, 1964), p. 44.

74

Voprosy Ekonomiki, No. 5, May 1951, p. 13.

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